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ORIGINAL ARTICLES:

Primitive Medicine. **Cleland.**

The Healing Art in Primitive Society. *By J. B. Cleland, M.D., Ch.M., Professor Emeritus, University of Adelaide.*

When one considers, in the animal body, how diseases are cured, how wounds are healed, and how errors in development are overcome, one is filled with wonder and admiration. It is all very well to say that by trial and error, over some millions of years, those individuals who did not react in the right way were eliminated, and those who did respond in the right way—we cannot say by chance and must infer that it was the inevitable result of the summation of experiences in the ancestral line back to the first beginnings of life—those who thus responded survived to transmit their hereditable qualities to their offspring. This actually adds to our wonder and admiration, for it means that the capacity to do all this, in the fullness of time, was latent in the first dim glimmering of life—and in the inanimate molecules and atoms and electrons that formed its scaffolding. In considering the practice of the healing art in primitive society, one must bear in mind this *Vis medicatrix Naturæ*, the natural tendency to heal. All that man can do, all that the skill of the physicians and the dexterity of the surgeons can accomplish, is to facilitate this natural process, to aid it if possible, and at least to see that cure is not impeded. A masterly inactivity may be more salutary than the " physics, bleeds and sweats 'em " of the famous Dr. Lettsom, or the water-cure of Dr. Sangrado. And thus it may be that the first crude attempts by man to alleviate suffering and cure disease may have been so futile that they did no harm, and that later in human evolution charms and exorcisms and the chicanery of the medicine man can be placed in much the same category, always remembering that hope and an earnest expectation of recovery are important therapeutic factors. In primitive society little of real value can have been done for the patient apart from such matters as splinting a fracture or extracting an arrow or spear point. Pummelling and kneading, sucking and scarification, bleeding, steaming over heated leaves, and drinking infusions of very doubtful value may have alleviated symptoms, but can have done little to forward cure. Only in the last two or three generations, with advanced surgery, anæsthesia, antibiotics and a more exact knowledge of physiology and biochemistry has real aid been given to *Vis medicatrix Naturæ*. One is still appalled, however, at the universality of useless polypharmacy.

There is no evidence, as far as I can ascertain, that any mammal or bird attempts to treat in any way injury or disease with the object of cure, apart from such actions as a dog trying to remove a grass awn from between the toes or the licking of wounds. No animal, for instance, has the dexterity and the intelligence to immobilize by splinting a broken limb.

Perhaps I am going too far when I say that there are no known examples of the practice of the healing art in animals other than man. E. T. Withington, in " Medical History from

the Earliest Times" (1894), says that bleeding "the most ancient and widely spread of surgical operations . . . is said to have been taught mankind by the hippopotamus. 'That intelligent animal,' says Pliny, 'finding himself plethoric, goes out on the banks of the Nile, and there searches about for a sharp-pointed reed, which he runs into a vein in his leg, and having thus got rid of a sufficient amount of blood, closes the wound with clay.'" Withington adds that the use of emetics is said to have been learnt from the dog and of hellebore from the goat, and that many authorities, including Aristotle, asserted that stags healed their wounds with the herb dittany.* The value attached to the last-named extended into mediæval times, for in "Jerusalem Delivered," Bk. XI, when Godfrey was wounded by an arrow, an "odoriferous panacy" distilled from dittany was applied to the wound, whereupon the arrow-head fell out, and the wound healed immediately! (Brewer's "Dictionary of Phrase and Fable.")

Amongst animals it is a biological crime to be sick or injured, for such members may be a danger to their fellows. The sick are hunted out or killed or voluntarily hide themselves away. The healing art is a purely human possession, and for its origin there are certain obvious prerequisites. First of all a brain to realize what is amiss and to devise means of alleviating the condition, if not of restoring the parts to the normal state. Then speech to store the experience of the race. And finally hands to administer the treatment. The healing art could not have arisen till man, in the course of evolution, had acquired sufficient intelligence and had invented speech. It is also doubtful whether much could have been done if man had not had hands with opposable thumbs, enabling him, amongst other things, to devise and use tools.

The books that I have been able to consult on the history of medicine usually start at a period when it is clear that the art of healing was already considerably advanced. For instance, they begin with references to disease and injury being attributed to the machinations of an enemy. This means that the art of medicine had reached a stage when explanations were sought for the occurrence of disease. There must have been a long period before this in the actual practice of medicine without any clear idea of why disease occurred, a period of pure empiricism and of learning by trial and error. May I make some suggestions as to the first probable glimmerings of medical knowledge as man emerged from his brutish ancestry, what might be termed eoiatrics, dealing with the dawn of the art of the physician?

What group of factors would affect the physical well-being of primitive man so as to require, if available, the art of the physician to help in the restoration to the normal state of wholeness, i.e. health? Poisonous foods might affect him; injuries and wounds, including broken limbs, might result from his environment and the attacks of animals; disease might result from bacterial, viral and zoo-parasitic invasions; ill-defined causes might be responsible for headaches, epileptic convulsions, insanity and a host of other ailments and illnesses; and finally childbirth might be accompanied with difficulties and dangers.

Man is omnivorous, as his dentition suggests, and primitive man might be considered as panomnivorous, eating when the occasion demanded, as must often have been the case with our Central Australian natives, almost anything edible, including insects. He must have got his knowledge of what is wholesome to eat by trial and error. It is rather interesting to note that a flesh-eating animal runs much less risk of eating poisonous substances than a vegetarian one. I can recall very few animal foods that are unwholesome in their own right.

* The woolly labiate plant called Origanum.

The Toadfishes and some others are well-known as causing deaths in those eating them, and the livers of polar-bears and seals are considered to contain such a high content of vitamin A as to cause illness or even death. As far as meat eating is concerned, primitive man had little need of the physician—or perhaps the undertaker—though doubtless in tropical seas and in Australia he might have had to learn by bitter experience the dangers from certain fish.

As regards insect foods, our natives eat termites, ants' eggs, the contents of the abdomen of the honey-ant (*Melophorus inflatus*), bugong moths (*Agrotis infusa*—very nourishing), and the large larvæ of moths and beetles found in the roots and trunks of trees and shrubs. They probably merely crush head-lice between the teeth, and of course do not eat them as food. In other parts of the world locusts are eaten, and doubtless many insects in various forms. One can think of few examples, likely to be tasted, that would be dangerous, though Spanish fly, which is a beetle (*Cantharis vesicatoria*), at once suggests itself. Insect foods may be thus dismissed as a source of unwholesomeness to primitive people.

Seaside-dwelling folk would be concerned with shellfish and crustaceans and similar sea-foods. Octopuses and squids are harmless as foods, and holothurians are edible (in a sense). Crabs and lobsters are credited with causing indigestion, but this would probably concern primitive people but little. I doubt whether any univalve shells are poisonous to eat, though mussels (*Mytilus*) may cause illness at times in Britain and Vancouver's people were affected by them on the coast of North America.

Primitive man, therefore, ran little risk of ill health from the animal foods he consumed or tried out for their food value. With certain classes of plant foods it was different. Apart from the effects of such a fungus infection as ergot in rye, I know of no grass grains that are toxic in themselves, though maize was under suspicion for some time in connection with pellagra. Lathyrism from consuming the peas of certain vetches (*Lathyrus* spp.) would not be recognized by early man as being due to this food. Our own natives in Central Australia, from their admirable methods of winnowing small seeds, have tried a number with success as foods besides the grains of grasses. These include the minute seeds, obtained in large quantities by pulling up the plants—and letting them partially dry on bare rock surfaces—of species of *Chenopodian* (Goosefoot) and *Dysphania* (Chenopodiaceæ) and *Portulaca* (Portulaccaceæ) and the small seeds of the Coolebah (*Eucalyptus microtheca*) shed from the minute capsules and of other plants similarly treated. The plants in Australia yielding seed in sufficient abundance by these primitive winnowing methods belong to families of plants which do not contain species likely to be poisonous. But doubtless elsewhere some kinds yielding poisonous seeds have been tested and rejected. We know, for instance, that the seeds of species of *Strychnos* may contain poisonous alkaloids whose properties must have become recognized by man before they were used for poisoning arrows and so on.

It was doubtless amongst the fruits that man had his earliest bitter experiences—though bitterness is not, in itself, a necessary guide to unwholesomeness. The berries of *Solanum ellipticum* and *S. coactiliferum* are eaten by the natives with gusto, though I have found them unpleasantly bitter. As a whole juicy and attractive fruits with brilliant or contrasting colouring may be looked on as advertising themselves to be eaten. It is their simplest means of dispersal of their seeds. One cannot of course attribute to plants the deliberate developing of luscious fruits for such a purpose, but when, in the course of development and differentiation of species fruits that were edible did arise, they served in assisting the species to survive, those plants best so fitted naturally tending to reproduce themselves more.

When food was plentiful, primitive man confined himself to the pleasanter or more abundant fruits, nuts, tubers and green foods available to him. In times of dearth, when life was in peril, he must have experimented with everything that appeared edible. In so doing, he realized, in himself or in others, that discomfort—it may have been vomiting, belly-ache, diarrhœa—or even death followed closely on eating certain things. Such were avoided in future—the dawn of preventive medicine. The nuts of some of our Australian cycads cause severe vomiting and other symptoms, as experienced by Captain Cook's people at Endeavour River and later by those of La Perouse and Flinders and Sir George Grey. Some of these victims were induced to eat these nuts by seeing the husks round native encampments, but they did not know that the starch had to be treated in changes of water so as to wash away the poisonous agent before ingestion. The ancestors of these natives must have experienced the same symptoms when first they ate these nuts untreated. Hunger must have induced them to try their consumption again from time to time. Was it an accident that eventually it was found that the starch, pounded up and steeped in water and the water poured off now caused no distress? Probably so in the first instance, but man's reasoning power had by now become sufficiently advanced to profit by this accident. In this we see one of the simplest examples of early prophylaxis guarding against the ill effects by washing away the poisonous principle.

Again taking Australian natives as examples, curiosity or hunger would account for chewing leaves as well as eating fruits, and so for the discovery of the pleasantly narcotic and fatigue-reducing effects of *Duboisia Hopwoodii* and of several of our species of *Nicotiana*. Here, surely, we see the beginning of pharmacy.

Here we may stop for a minute to consider the importance of curiosity in the evolution of man. Curiosity appeared before speech, as can be well seen in the higher apes and monkeys. Intelligent curiosity should be distinguished from simple curiosity without obvious meaning or advantage—as is seen in emus being attracted by the native waving about a large moth attached to a noose or in wild horses circling round the approaching human to turn about and inspect him from time to time, though this may be to estimate the danger.

Discomfort and incapacity led to the recognition of any disabling condition in developing man. Discernment and curiosity would lead to its recognition as disease in others. I know of no clear evidence that other animals than man recognize disease as such amongst their mates or young. They may be concerned vaguely because the sick creature cannot keep up with the others or is in some way behaving in an unusual fashion, but do not realize why. Man perhaps alone early recognized disease in himself and then as producing like effects in others. As we have just seen in the above review of man's food plants, probably one of his earliest realizations was that certain plant foods caused the eater to vomit or to have pains in the stomach or diarrhœa—and seeing these effects in others, he understood their cause.

The realization of death must have also been an early manifestation of man's growing intelligence. Did it evolve before speech was invented? Vaguely, perhaps. Death, presenting itself to our early ancestors for the first time, must have been incomprehensible, unless its occurrence had been witnessed by others who were able to relate their observations to the younger members.

Let us return to consider further causes of disease other than from things eaten. The next category consists of injuries and wounds. Animals tend to avoid the causes of injury, by experiencing pain or perhaps to some extent by " instinct.". One likes to think that the

exquisite pain one feels when the knee-cap is knocked is due to the necessity to teach the young that at all hazards the legs must be protected, as the individual would perish if they failed him. Early human intelligence must have recognized that injuries and cuts were due to their usual causes, including the attacks of wild animals and the rage or carelessness of fellow humans. One of the first attempts at treatment must have been trying to staunch a bleeding wound, following the recognition by direct observation or by the spoken experience of others that much loss of blood might mean death. A broken limb, particularly a leg, caused such disablement as necessarily to have attracted much attention. Examples of broken arms would show that healing might eventually occur, perhaps with deformity. At first there would be no knowledge that the bones of the leg, if kept quite quiet in a bed of mud for some weeks, would unite. The invention of a splint by some member of the group with unusual perspicacity must have been a great step forward. Its primal object probably was the reduction of pain, by preventing movement of the injured part ; then followed the fact that a certain amount of locomotion might be possible, and finally after months that healing would ensue.

Many thousands of years must have separated the present Australian natives from these ancestors who first, dimly and vaguely, began the practice of the healing art. Nevertheless, their practices to-day for wounds and even fractures differ but little from the ancestral behaviour. In fact, it is rather hard to see how they could differ greatly until ligatures for vessels, suturing of wounds, antisepsis and the specific treatment of infections were discovered. Their treatment of open wounds in Central Australia is, to bacteriological minds, appalling. On one of our expeditions we saw a native near Coniston with a huge wound caused by a spear on to which, and into which, dust had been thrown. This would quite naturally from its fine particulate nature tend to stop hæmorrhage, but to our minds the dangers of sepsis and tetanus were great. We, wisely I think, decided that it would be better not to interfere in any way with the native treatment. We would probably do no good, and if the patient died we might be held responsible. He apparently recovered. Now this was in occupied cattle country where introduced pathogenic organisms had doubtless accompanied man and his domestic animals. The treatment adopted was that employed from time immemorial and some people at least recovered in spite of it, though others may have died. In the latter instances it might be difficult to decide whether they had died from the extent of the wounds or from superadded infection. It is quite likely that tetanus bacilli were not indigenous to Australia—the intestinal canal of horses seems a particularly favourable multiplying ground for them, and such a habitat is not like the intestines of kangaroos. A case of tetanus from a wound caused by the accidental discharge of a firearm occurred in virgin country during a Western Australian exploring expedition, but the source of the organism was most likely from the horses of the party, and not from the ground itself. There is good reason therefore to think that sepsis and tetanus and perhaps gas gangrene rarely affected the wounds of primitive man and of our natives before contact with Europeans. A paper by Dr. T. A. R. Dinning (*Med. Journ. of Australia*, Dec. 11, 1949, p. 717) shows that broken limbs in Australian natives often set themselves remarkably well, though sometimes with much deformity. He found 94 healed fractures in the examination of about 30,000 bones. MacPherson, in New England natives, records that strips of bark were used as splints, and Roth states that Queensland natives tied several sticks round the broken limb or wrapped it in opossum skins tightly bound round with string. Ian McKenzie, in " Infancy in Medicine," states (p. 349). " I do not know on what authority, that the natives of South Australia ' after setting the

limb, encase it in clay, which hardens and protects the fracture from displacement. The results are said to be excellent.' " Dr. John Hoets, in a letter (*Med. Journ. of Australia*, Nov. 26, 1949, p. 794), describes this same procedure, but could not remember where he had seen it. The patient was taken to the waterside, a clay bank for preference, some clay puddled, and then he was placed in a " form," the injured limb straightened and wet clay heaped up all round. The clay was allowed to set and dry and a shelter built over the injured person. A hole was scooped under his buttocks. Here he lay till the bone was united. McKenzie also mentions that the American Indians used splints of wood or bark, and on the island of Nias splints were removed in four weeks and if the limb broke again and the patient remained lame, the doctor disclaimed all responsibility, " for who," says he, " can tell what goes on in the inside of a man ? " Egyptian mummies have been found with splints still attached, but these people can hardly be considered as primitive. Harley, in " Native African Medicine," speaking of the natives of East Africa, says that they had developed considerable skill, raised the bone in depressed fracture of the skull, and practised reduction of displaced bones in fractures by traction and manipulation.

W. H. R. Rivers, in " Medicine, Magic and Religion," groups the causes of disease, as inferred by mankind, into three chief classes : (1) human agency, in which it is believed that disease is directly due to action on the part of some human being ; (2) the action of some spiritual or supernatural being or of some agent which is not human ; and (3) what we call " natural causes." With one or other or both of these first two may be associated the third, which he deals with under the heading of " remedies of the ' domestic ' order."

In his last chapter, Rivers says that man's endeavours to cope with disease took at first two directions. " In one he ascribed disease to the action of beings different from himself, but capable of being reached by rites of prayer and supplication. Since these rites . . . reveal an attitude of respect and appeal and imply powers which man does not himself possess, it seems legitimate to regard the beings . . . as higher and more powerful than himself. The general body of rites and beliefs . . . makes up the aspect of life we call religion . . .

" In the other direction disease was ascribed to the action of other human beings, or of beings of a non-human kind believed to be amenable to processes of a compulsory nature, and therefore less powerful than man himself, so that the attitude adopted towards them implied neither respect nor appeal . . . Man compelled or induced the being to whom disease was ascribed to withdraw the agencies by which the illness was being produced, or himself employed measures designed to negative their effects. Beliefs and measures of this kind make up the aspect of life known as magic . . .

" The great majority of the measures by which existing savage peoples attempt to cope with disease fall into one or other of the two categories of religion and magic . . . It was only after long ages, and in some parts of the earth, that man reached a conception of disease according to which it is ascribed to processes similar to those underlying modern systems of medicine."

I have quoted thus extensively from the opinions held by Rivers because I think that he is mistaken in considering that " man's endeavours to cope with disease took at first (these) two directions." I have attempted to show in my introductory remarks that a dawning intelligence must early have directed man's attention to obvious causes of departures from well-being such as the effects of poisonous fruits, and wounds and fractures. Abdominal discomfort, relieved by vomiting the peccant material, and griping relieved by diarrhœa might quite well have led in suitable localities to the employment of natural emetics or

purgatives to relieve such symptoms. The discovery of fire, no mean mental effort, added another source of injury but also a further therapeutic measure. Proximity to a fire must have relieved some pains and aches, and hot sand been a source of comfort in some conditions. Having ascertained the causes of some forms of ill health, the enquiring mind may quite well have assumed that other diseases likewise were due to causes that might be ascertained. It seems to me reasonable to assume that a large store of " domestic remedies," as Rivers calls them, with corresponding explanations for their use, had accumulated before man had recourse to magic or religion to explain the causes of other unexplained illnesses that affected him and to devise means of combating them and thereby curing the patients.

This is not the place to consider how magic and religion were evolved. In spite of Rivers considering that they are separate and distinct, it seems to me more likely that they had a common origin and intergrade to such an extent that it must be difficult sometimes to say into which category a particular form should be placed. Their genesis must again be due to enquiring minds seeking an explanation of events around them and endeavouring to find out their meaning. Birth, death, the seasons, the sun, moon and stars, all nature required such explanation. If no obvious one presented itself, what more natural than to assume that there were other beings whose doings or whose power were responsible. Be this as it may, I would infer that magic or religion developed on its own and not at first to explain sickness, but once evolved it would be called upon to explain the occurrence of disease that had no obvious cause.

Religion and magic, having once entered the field of medicine, it is not surprising that they took almost complete possession of it, leaving only a few minor maladies to be dealt with by domestic medicine. As regards magic, Rivers distinguishes three classes : (1) those in which something is projected into the body of the patient ; (2) those in which something is abstracted ; and (3) those in which the sorcerer acts on some part of the body or on some object connected with the body, believing that thereby he acts on the patient's body as a whole.

Under " Remedies of the ' Domestic ' Order," Rivers says that " just as amongst ourselves, the doctor is only sent for when domestic remedies fail, or when the illness is at once seen to be serious, so do the Melanesian, Papuan and other lowly peoples only consult the sorcerer, priest or leech when their remedies of the domestic order fail, or when the gravity of the case demands more powerful remedies." Amongst the Kai of north-east New Guinea, wounds are treated with a poultice of powdered cycad fruits, headache by cuts on the forehead, nasal catarrh by thrusting a stick into the nostrils, pain in the chest by stroking with a nettle, etc. These people employ five modes of treatment, which Rivers points out are found widely over the earth, i.e. poulticing, blood-letting, massage, vapour-baths and counter-irritation. Blood was also drawn by applying leeches to the seat of pain.

F. E. Clements, in " Primitive Concepts of Disease " (*Univ. of California Publications in American Archæology and Ethnology*, Vol. 32, No. 2, pp. 185-252, 1932) gives an excellent account of the subject, though he makes but passing reference to simple conditions with a more or less obvious natural cause for which the " domestic remedies " of Rivers were applied.

Clements classifies these concepts into (1) Sorcery, (2) Breach of taboo, (3) Disease-object intrusion, (4) Spirit intrusion, and (5) Soul loss.

(1) Under *Sorcery* he groups those theories ascribing sickness to the manipulations of persons skilled in magic or to the operations of human beings who exercise some control over the supernatural world. He recognizes two types, *imitative magic* in which an image of the

victim is transfixed with darts or otherwise maltreated, causing the person concerned to fall ill ; and *contagious magic* in which some part of the victim's body, such as hair or nail clippings, or of his excrements or clothing are subjected to magical procedures, thus causing disease in the victim. Clements finds that belief in sorcery as a cause of disease is distributed " literally to the ends of the earth," even the Fuegians believing in contagious magic. " Likewise the Australians, also one of the most isolated and backward of primitive peoples, have a well-developed system of sorcery, although here the method is either to " shoot " some object magically into the victim or to abstract his soul, which is regarded as resident in the kidney fat " (p. 202). Consequently his three references to sorcery as a disease concept in Australia appear also under (3) Disease-object intrusion, and apply to the Euahlayi tribe north of the Barwon (Mrs. Langloh Parker), to the North Central Tribes (Spencer and Gillen) and to the Southern Tribes (Howitt).

(2) *Breach of Taboo.* Clements finds that this as a cause of disease occurs in certain separated areas, particularly Middle America, and the Arctic, and in the Old World, Polynesia, Melanesia, parts of Indonesia including the Andaman Islands and North India, all as a fairly continuous area of occurrence, and elsewhere sporadically. His only Australian example is from the Euahlayi tribe, where old Bootha came up to see a sick visitor to Mrs. Parker's house. Bootha called up the spirit of Guadgee, a black girl who had been one of Mrs. Parker's favourites, from whom she obtained the information, conveyed ventriloquially, that " Adelaide (the girl visitor) was made ill because she had offended the spirits by bathing in the creek under the shade of a Minggah, or spirit tree, a place tabooed to all but wirrenums, or such as hold communion with spirits." Clements finds, associated with the breach of taboo but by no means co-extensive with it, confession as a means of treatment. This is found amongst the Eskimo, in the central parts of America, amongst the peoples in Africa, and in Polynesia, New Zealand and Hawaii. There is no doubt of the efficacy of confession on a troubled mind, but even in more physical ailments sharing troubles and confessing our sins with the resulting calmer outlook may act on hormones playing a greater or lesser part in the repair of damaged tissues. Clements considers the concept of breach of taboo as a cause of disease to be the latest elaborated of his five and considers that treatment by confession, arising in regions of its greatest elaboration, was almost a natural consequence of the concept.

(3) *Disease-object Intrusion.* Clements points out that " splinters, arrowheads and like objects embedded in the flesh are widespread experiences and might give rise to the idea that sickness in general is due to some foreign object in the body." This does indeed seem very reasonable and when wounds became fly-blown ; or conditions like Guinea-worm existed, where the worm appears on the surface in an ulcerated area and can be wound round on a stick a little at a time ; or jiggers penetrated the flesh, the inference that other conditions were due to similar causes must have presented itself to enquiring minds. Not being able to see by ordinary vision an obvious cause in every case, disease might be explained by the object only being seen by certain persons, as those with " second sight." These persons, being astute and perhaps of higher intellectual attainments than the majority and having acquired, it may be accidentally, some reputation, would feel it incumbent on them when consulted to produce if possible some tangible object from the affected part. Sleight of hand, evidently a very early human acquisition, enabled this to be done. Our mental make-up is indeed incongruous. Every medicine-man who practises such deceit must know he is himself to some extent a fraud, but he seems to have implicit belief in the genuineness of his colleagues !

Clements finds " disease-object intrusion " a widespread belief, as can readily be understood. It occurs almost throughout America, in Siberia, in western Europe, in small areas in Africa and Asia, and in Australia and the Malay Archipelago. He considers that the concept may perhaps be traced back to a Palæolithic origin and that it was at one time continuous over the areas mentioned but is now overlaid or submerged in places by later concepts. In discussing disease-object intrusion, he points out that sucking treatment is almost co-extensive with it. It is indeed a very natural procedure tending, even if no actual foreign bodies are extracted, to soothe irritation and promote a flow of lymph and blood containing perhaps antibodies and other healing substances. Moreover it presented an opportunity for producing a secreted object, and may even have suggested such a procedure to minds of not the greatest integrity.

Clements mentions that the idea that dental disease was due to worms in the teeth is found in a few scattered places in America, Asia, Madagascar and Europe and amongst the Maoris. He thinks that the observation of nerves, as he calls them, clinging to extracted teeth, might give rise to this idea, but surely the growing pain of toothache in itself would suggest something like a worm burrowing in the tooth.

Mrs. Parker, in " The Euahlayi Tribe," gives a graphic account of the training undergone by one who has been chosen to be a medicine-man or *wirreenum* (doctor-wizard) in Chapter IV (p. 24). This is a personal experience related to her by an old doctor and shows that the initiate, perhaps specially chosen because he seemed likely to be responsive, is in a very susceptible frame of mind, through excitement and suspense and perhaps lack of food, so that dreams are very likely to occur and are coloured by anticipation. As amongst other less advanced races and sometimes in our own children, what occurs in dreams may with difficulty be separated from actual occurrences. There can be no doubt that ordeals, such as Mrs. Parker describes, whether real or imaginary, must make the initiate feel that he is one set apart from the majority and give him confidence and ensure success.

(4) *Spirit Intrusion.* Clements notes that this concept seems to be continuous for Europe, Africa, southern Asia and most of Oceania, but is more sporadic in the New World. It is not known in Australia. He considers that it is considerably later than the concepts of disease-object intrusion and of soul-loss. It may be cured by exorcism ; by mechanical extraction for instance by massaging towards the extremities or by bleeding ; or by transference to animals or to plants or inanimate objects. Possession by spirits was a recognized cause of insanity and very often the gods were believed to speak through the ramblings of the possessed, whose obscurity doubtless gave rise to opportunities for the most clever and designing to find a meaning that suited them.

(5) *Soul Loss.* This concept of disease, Clements says, though not universal, has an enormous extent, " reaching to the limits of the inhabited earth." The soul may be lost by sneezing—many persons still say " God bless you " to anyone who sneezes, originally to help the return of the soul ; may be captured whilst it is wandering in dreams ; may leave or enter the head, especially by the anterior fontanelle—hence the necessity to protect this part in infants ; may be eaten by its captor ; may be lost by fright ; may reside in the heart, or the liver, or the gall-bladder or the kidney fat. Children are particularly susceptible to soul-loss and must be carefully guarded against sneezing or fright. Obviously the loss of the soul, or its embarrassment when wandering, will produce illness in its owner, until the soul is restored to its natural abode. Should this fail, death may occur.

Mrs. Parker (p. 27) gives an interesting account of the dream spirits of her natives. The dream-spirits of the *wirreenums* or medicine men are under the control of their owners and in fact in their wanderings carry out the owner's behests. The dream-spirits of the other natives are called by a different name, Doowee, and are subject to dangers when they go a-wandering. Hear Mrs. Parker's account of them:

> "These dream spirits are rather troublesome possessions; while their human habitations sleep they can leave them and wander at will. The things seen in dreams are supposed to be what the Doowees see while away from the sleeping bodies. This wandering of the Doowees is a great chance for their enemies: capture the Doowee and the body sickens; knock the Doowee about before it returns and the body wakes up tired and languid. Should the Doowee not return at all, the person from whom it wandered dies. When you wake up unaccountably tired in the morning, be sure your Doowee has been 'on the spree,' having a free fight or something of that sort. And though your Doowee may give you at times lovely visions of passing paradises, on the whole you would be better without him.
>
> "There is on the Queensland border country a dillee bag full of unclaimed Doowees."

Dan McKenzie, in "The Infancy of Medicine" (1927) (p. 3), commences his book with the following sentences: "In the beginning Medicine and Mysticism are one and indivisible. But the union, perfect though it is for immeasurable periods of time, nevertheless manifests a tendency, even in the most primitive communities we are acquainted with, to break up. And eventually, after protracted struggles on both sides to effect a compromise, a complete dissolution of partnership takes place." I have already indicated that in my opinion obvious simple remedial measures were the first fruits of the Healing Art, and that only later, when explanations for certain illnesses were not naturally forthcoming and when religious beliefs had sprung up, the latter gave rise to theories of causation that were satisfying, and this again quite reasonably to measures of control based on these theories. McKenzie goes on to say: "Being thus a mediator between the unseen powers that activate the universe and the ordinary visible people of the earth, the primitive medicine-man, in virtue of that office, is expected to cure disease among his friends and to produce disease among his enemies."

H. W. Haggard, in "Devils, Drugs and Doctors" (1929) (p. 281) considers that all methods of treating disease belong to one of three categories, first faith healing, where an attempt to remove the morbid state is made by means of influences exerted on the mind; secondly, by hygienic therapy, founded on recognition of the fact that the body tends to cure itself and thus should be aided as far as possible; and thirdly by the use of drugs, a relic of poison lore.

Sir Heneage Ogilvie, in an article "The Large Bowel and Its Functions" (*Proc. Roy. Soc. Med.*, Vol. 44, No. 3, March 1951, p. 200), says: "Man, as soon as he learned to reason at all, must have been interested in his fæces, as the one part of him that was discarded daily. He must have noted the variations that accompanied ill-health, the looseness that followed a bellyache or an experiment with a new food, the cessation that presaged death . . . Many native races . . . developed the latrine system at a time when the habits of Europeans were indescribably filthy. The first explorers to reach New Guinea found that all villages had pit latrines 30 to 40 feet deep, too deep for hookworms to get to the surface or for flies to get down . . . When we realize that man has associated his motions with his health from dim antiquity, it is not surprising to find that the oldest therapeutic device in the world is the enema. There is to-day no race so primitive or so sequestered that rectal lavage is

unknown to them. Herodotus tells us that the ancient Egyptians maintained their health by giving themselves an enema at every cycle of the moon. The Ebers papyrus gives prescriptions for enemata and directions for giving them. Pliny goes further and says that the Egyptians learned the habit from the Ibis, which stands on the banks of the Nile and ' washes the inside of its body by introducing water with its beak into the channel by which our health demands that the residue of our food should make its exit ' . . . The methods used to-day for giving enemata by the primitive races are very similar. All are remarkably traumatic, and the number of unrecorded deaths in the wilder regions from perforation of the pouch of Douglas probably exceeds those from duodenal perforation in the world's capitals. The commonest device is a cow's horn, with the tip sawn off or drilled. The patient sits in a swiftly running stream, inserts the tip of the horn into his anus, and allows the water to flow in under pressure ; when he feels full he withdraws the horn and expels the contents of the bowel into the stream. Alternatively the horn may be filled with some herbal concoction, usually very hot, and, after inserting the point, the medicine is blown in by a witch doctor or a friend. Hollow reeds were also used, particularly for children. A common form of enema syringe described by Hippocrates, but still used to-day in many parts of the world, is an animal bladder (usually that of a pig) lashed to a hollow reed : this instrument is filled by gravity and emptied by manual pressure."

In spite of Sir Heneage's statement that there is no race so primitive or sequestered that washing out the rectum is unknown to them, I know of no suggestion that anything like giving an enema was known to the natives of Australia—many of our people lived in regions where water was scarce and of course none of our indigenous mammals had horns wherewith to administer an enema.

Methods of Treatment in the Euahlayi Tribe

Mrs. Parker relates that snakebite was cured by sucking the wound, and so drawing out the young snakes that had been injected, and cauterizing with a fire-stick ; headaches and pains by tying a piece of opossum's hairstring round the sore place, taking one end in the mouth, and pulling it round and round until it drew blood ; and rheumatic pains by steaming from twigs on a surface rendered hot from a fire, the patient having an opossum skin rug thrown over him. Bleeding of wounds was stopped by the down of birds. Various leaves were ground up and the pulp rubbed over the part. Broken limbs were treated by wrapping grass and bark round them and binding them up.

Tasmanians

Little is known of the diseases or their treatment in the Tasmanians. Brough Smyth quotes from the *Tasmanian Journal of Natural Sciences* that they resorted to bleeding by cutting with flakes of stone, though this sounds more like a ritual than treatment ; and that they believed in the efficacy of charms and particularly in a piece of bone from the skull or the arm of a deceased relative sewed up in skin and worn round the neck as a protection against sickness or premature death. Sacred stones, it is said, could cause disease in their enemies and cures in their friends.

Andaman Islanders

A. Radcliffe-Brown, in " The Andaman Islanders," gives a short acount (p. 175) of their medicine-men and the treatment of illness which is considerably like that of our natives. The medicine-man is called *oko-juma*, which means dreamer, and can communicate with the spirits of the dead, usually in dreams. In dreams also he can cause the illness of an enemy

or cure that of a friend. He may be consulted in sickness when he may recommend some recognized remedy or he may dispel the spirits that are causing the disease by conjuring them away or by using some subject or object known to have value in keeping spirits at a distance, or by persuading them in dreams to go away.

Amongst remedies with magical properties Radcliffe-Brown mentions red ochre mixed into a paint with pig or turtle fat and applied to the throat and chest for coughs and colds and sore throats, or under the nose so that its " smell " will cure the patient or for dressing wounds or centipede bites. Red ochre, white clay or an olive-coloured earth were used as internal medicines. Leaves of a certain plant may be crushed and rubbed over the body, or the patient may inhale the odour.

The Negritos of Malaya

I. H. N. Evans, in " The Negritos of Malaya " (1937), says that the *halak* (medicine-man or shaman) is " both their doctor to cure disease by the supernatural powers that he is reputed to possess and the medium through whom they are in communication with the greater and lesser supernatural beings." He uses a quartz crystal for divination and may administer water in which it has been steeped to sick persons. The shaman can change into a wer-tiger at will and back again. A mere slip of bamboo about two inches long may be used for " pointing," being commanded by the shaman to go and kill his intended victim and thereupon it flies through the air and pierces the heart. Evans says that there are some quasi-taboos connected with the eating of fish and flesh—for instance to refer to a fish called *betok* as *betok balok* (? ivory *betok*) would lead to a severe intestinal disturbance. A few diseases are mentioned such as epidemic influenza, tinea (ringworm), yaws and leprosy but no mention of any treatment for them (p. 18).

The Hill Muruts of North Borneo

Dr. M. C. Clarke, in " Some Impressions of the Muruts of North Borneo " (*Trans. Roy. Soc. of Trop. Med. and Hyg.*, Vol. 44, No. 4, Feb. 1951, p. 453), says that village medicine among the primitive Hill Muruts (Orang Bukit) " consists of bacha-bacha (incantations by priestesses called babalians), blood-sacrifice of foods and pigs, and the taking of various herbal remedies. Various taboos (pantang) must also be observed during illness. Assistance in complicated labours may become unbelievably violent." He goes on to say that " in early days the fears and excitements of headhunting formed the Muruts into compact, highly organized societies, each with a firmly established authority, recognized laws and customs, and a host of colourful superstitions and beliefs. With the gradual cessation of this unfriendly competition between hostile groups, there has been an inevitable crumbling of the former social structure, with diminished authority within village units and lessened respect for previous adat (custom), with little to replace them but a carelessness and lack of character which are demoralizing in the extreme.

" The suppression of headhunting and the assumption of peaceful ways have not occurred without a certain price being paid. The quarantine-effect of previous customs has been largely lost and the spread of disease is facilitated by the freer social and commercial intercourse now obtaining. Infectious diseases, finding a fertile soil, have often decimated kampongs, leaving the survivors shaken and demoralized."

The Melanesians of British New Guinea

C. G. Seligman, in "The Melanesians of British New Guinea" (1910) (p. 281), when dealing with the Roro-speaking tribes limits the term sorcery to magical practices directed towards the production of disease and death, and to the efforts made to cure disease so produced. "The two media believed to be most frequently used by sorcerers to produce disease and death are snakes and certain magical stones, but besides these the leaves and roots of a number of plants form part of every sorcerer's kit." Seligman says that the most careful enquiries failed to suggest that the sorcerers had any knowledge of vegetable or mineral poisons and although jequirity is common in the district no natives seemed to know of its toxic properties. However, in the Milne Bay area (p. 639) there are certain plants which when mixed with a man's food are said to produce vomiting and purging and death in two days, and Seligman queries whether these results are due to a real poison or the effects of magic. He mentions several other plants whose lethal or deleterious qualities may be dependent on their magical application. A homicide, it is interesting to note (p. 130), gets thin and loses condition. This was because he had been splashed with the blood of his victim and as the corpse rotted so he also wasted. Anyone who got thin without losing his health and for no obvious reason was suspected of having killed someone.

Africa

G. W. Harley, in "Native African Medicine" (1941), deals more particularly with the Mano tribe of Liberia. The various peoples whose medical practices he describes cannot be called primitive, as some show considerable surgical skill. For instance among the Baganda when the abdominal cavity has been ripped open in battle, the surgeon may apply a gourd shell to hold the viscera back and then sew the abdominal wall over it. In Rhodesia the roots of the castor-oil plant may be used as an abortifacient, inoculation may be practised for smallpox and, what is of exceptional interest, immunity to snake-bite may be obtained by rubbing a powder composed of the fangs of poisonous snakes, the tips of their tails, and powdered charcoal made from certain roots, at intervals into gashes cut in the skin of boys.

The Pygmies of Central Africa and the Fuegians

I have not been able to obtain in Adelaide any literature describing either the diseases of these primitive folk or their treatment.

Childbirth

I know of no instances in mammals other than man in which aid is given when difficulty arises during parturition and birth is delayed or complicated. As a rule, especially with multiple births, labour is easy. In fact it is difficult to see what could be done except in the case of monkeys with hands who might attempt to pull the baby out.

Mr. V. D. Haggard, Director of the Zoological Gardens, tells me that recently one of the gibbons, in giving birth, had an abnormal presentation with delay, and the infant had to be surgically removed, an arm obstructing labour. The cord had presented, which the mother had broken, thus of course entailing death of the infant. He thinks that labour may normally take place on a perch (or tree) and if so it would be necessary for the mother to catch the infant as it was born. In a baboon previously the baby had had to be removed. These of course are births under unnatural conditions and long confinement may have played a part, perhaps by changes in the bones, in producing difficult labours. If similar difficulties occur in the wild state, the mothers would necessarily perish. He thinks that when birth is

imminent, the mother-to-be retires by herself, but if she does not or cannot do so and others of her species are watching, the latter might perhaps interfere merely from curiosity but would have no idea, if delay occurred, in trying to extricate the babe.

The intelligence of man must, early in his ascent, have led to the recognition of what childbirth means and what it results in. Undue delay would at once suggest the possibility of helping by the most obvious means, that is pulling on the presenting part or, if the placenta is concerned, on the cord. Such attempts at assistance might be sometimes successful, but more often fatal to mother and child.

Mrs. Parker (p. 40) gives an amusing account of circumstances that may hinder birth, the coy infant refusing to come forth at its grandmother's request, in fact " staying put " as long as it hears her voice, so that she of necessity remains silent throughout ; requests on behalf of other relatives may be equally ignored, as are suggestions that this is a very interesting and beautiful place that the baby is coming to with plenty of delightful things to eat. Eventually it may be necessary, perhaps when birth seems imminent, for an old woman to produce a *wi-mouyan*—a clever stick—which is waved over the mother at the same time that a charm is crooned.

A nursing mother in the Euahlayi tribe with not enough milk may be " steamed " over old-man saltbush and hot twigs of it laid on her breasts.

During a recent visit of inspection to Ooldea a full-blood baby was born on April 27, 1951, weighing 7 lb. 9½ ozs. The cord had been bruised off with a stick or stone close to the placenta. The placenta had been buried " deep " beside the mother and the fire brushed over the place. No hæmorrhage had been apprehended. The new-born babe was lying on a garment in the sand and sand was present on part of its body. The cord was still quite fresh-looking when we saw it some hours after birth, with the separated end jagged. Mrs. Green, wife of the missioner, said that a week or so after birth the " soft spot " (fontanelle) on the baby's head would be plastered with mud mixed with hair from a relative of the colour that they wanted the baby's hair to be. When the infant sneezes, the mother at once places her hand over the " soft spot." The baby is not put to the breast for twelve to eighteen hours. This one had been born about midnight (moon 20° up), so it would be fed in the afternoon.

During labour the sister, rarely the mother, or some relation or person handy sits behind the woman and supports the back and sides when the pains are on. Some women cry out a little when they will be told to " keep quiet, keep quiet. You don't want the men to hear you. *Kunmarri* (keep quiet)."

In one case, the vaginal opening was too small. A capable woman came over from the camp for a safety-razor blade, which she broke in two. She cut the posterior border of the perineum deeply, whilst Mrs. Green held one leg apart and the native woman the other. The mother then sat up, squatting, and the baby was born about a minute after the cutting. This patient had been in labour at least six hours—too long, " must be die."

One woman had a " fainting fit " during labour—clenched teeth, unconscious, no twitchings—which lasted about three-quarters of an hour. She recovered from this and sat up, when a second one occurred. However, she became conscious again and the baby was born.

One baby, 6 lb. 9 ozs. when born, was now, at the age of 28 days, 8 lb. 1 oz. Another baby, 3 or 3½ lb. in weight, died in a few hours. Sometimes the cord was put in hot water to stop the bleeding, but such treatment could not have taken place before European utensils were available for holding the water.

In infanticide (e.g. one of twins), the side of the head is crushed in, or the infant is hit on the head with a stick, or the head may be trodden on. Mrs. Green has heard that the brain may be taken out and cooked (perhaps the whole head cooked) and some of the brain given as "little emu" to the older child (if the killing has been because of the pregnancy coming too soon after the last baby was born) to strengthen him against sickness by the dead infant's spirit and power being transferred. Similarly sand from the sides of a grave at the final burial is rubbed on the legs of bystanders (children, etc.) to make them good walkers.

Dr. J. de Vidas, in an article "Childbirth in the Aranda (Central Australia)" (*Med. Journ. Australia*, Sept. 27, 1947, p. 394), says that the natives had no method of calculating the length of gestation. Pregnancy was recognized by movements at the fourth month. In labour the woman squats on her heels, supported by a woman behind and one in front. During the pains the former presses firmly on the flanks and at their height exerts strong pressure downwards on the fundus. There is no interference during labour. No assistant touches the child or the vaginal outlet till the head and body are born.

Circumcision

Circumcision, or the more simple incision of the upper prepuce, occurs, according to Dan McKenzie, over the entire African continent, in the Levant, Mesopotamia, India, Polynesia, Australia and North and South America. N. B. Tindale, in the map accompanying his "Distribution of Australian Aboriginal Tribes: A Field Survey" (*Trans. Roy. Soc. of S. Australia*, Vol. 64, Part 1, July 1940, p. 140), shows the distribution of the practice of circumcision in Australia. It occupies the whole of the sub-continent west of a wavy line running from the bottom of the Gulf of Carpentaria to Adelaide, with the exception of narrow coastal strips in Western Australia and the Northern Territory. Subincision is co-extensive except in the southern half of the eastern portion, where the limit is along a line from the upper Diamantina to near the top of Spencer Gulf. In Australia it seems likely that the practice accompanied one at least of the three invasions of separate races that Tindale and Birdsell consider were responsible for our present natives. There is much in favour of this ceremonial rite having been diffused from a central source as suggested by Elliot Smith and Perry in the diffusion of culture. There is no satisfactory explanation of its origin, but once having been started those who had been circumcised would be likely to make certain that the younger generation were similarly treated.

It was quite an impressive ceremony, on the first University of Adelaide Anthropological Expedition in 1926 to the Macumba, to witness the performance of the operation at daybreak at the end of a series of ceremonies. The boy concerned was hoisted on to an operating table made of the backs of men, and the foreskin pulled forward and hacked through with a number of cuts with a stone knife. I felt the boy's pulse throughout the operation and there was no increase in beat. Though he seemed to feel pain, the long preparation, the excitement and the knowledge that he was approaching manhood all probably helped to dull it. He afterwards sat over a small smoky fire whilst blood was still dripping. The use now-a-days of old safety-razor blades is a dangerous innovation, as bleeding may be free. The stone knives hacking their way through tended to bruise the tissue and facilitate the clotting of the blood.

Subincision

Subincision apparently only occurs in parts of Australia and in Fiji and another operation on the urethra in Tonga. With our own natives, repeated cuts are made over the under-surface

of the urethra with a stone knife. The origin of the rite is probably that suggested by Dr. H. K. Fry on one of our expeditions, that a native, born with hypospadias, instead of being ashamed of his defect made eventually a feature of it, pointed out supposed advantages in a flattened organ, impressed his colleagues and induced them to practise it on the young initiates. To the oldest men he may have subtly suggested that the operation would keep the novice for some while from any wish to associate with women. Those subincised would again see that all future initiates were so treated.

Trephining

In the Wellcome Historical Medical Museum is a skull with a trephine hole which is of interest to us as it had a label, when I visited the museum just before the last war, saying that it came from Australia. The label should have been " through " Australia, as I know of no trephining by our aboriginals. Withington, in " Medical History from the Earliest Times " (1894), mentions that in 1873 Dr. Prunieres (p. 7) exhibited a disc of bone taken from a skull found under a dolmen in Lozere in France. Later several hundred prehistoric skulls that had been trephined were found in France, no less than upwards of sixty in one cave, apparently belonging to the later stone or bronze age. It has been thought that such a treatment may have been employed in cases of epilepsy, but Broca, the anatomist, thought it had a religious significance, the survivors of the operation acquiring a special sanctity. The excised fragments of bone were often used as amulets. The trephining was achieved either by sawing, or by a chisel-like action, or by boring a series of holes close to one another. Withington mentions that a very similar custom prevails in the South Sea, whence doubtless came the skull in the Wellcome Museum, and that on the Island of Uva headache and other disorders are attributed to a crack in the skull or to pressure on the brain and the recognized treatment is to scrape a hole through the bone near the top of the head.

Primitive Dentistry

Roswell Park, in " An Epitome of the History of Medicine," 1903, has a chapter on the History of Dentistry. Though the earliest examples he gives of the applications of dental science are amongst peoples far removed from the category of " Primitive Society," they may be briefly mentioned as curiosities. Egyptian mummies have been found with teeth filled with gold or with wood covered with gold. Both Hindoos and Egyptians inserted artificial teeth. Celsus, who was a contemporary of Christ and of Cæsar, recommended filing off irritating edges, and the bursting of hollow teeth by putting pepper-corns into them which absorbed moisture and swelled and thus broke the tooth in pieces. He quotes from Garriopontus, A.D. 1045 : " On the island of Delphi a painful molar tooth, which was extracted by an inexperienced physician, occasioned the death of a philosopher, for the marrow of the tooth, which originates from the brain, ran down into the lungs and killed that philosopher." This, Park thinks, must be the first record of a death after extraction of a tooth—by its slipping down into the lungs.

Conclusion

I trust that, in the foregoing pages, I have given some indication, from the point of view of a pathologist and naturalist, of the origin and progress of the healing art in primitive society. We in Australia are particularly fortunate in having still in our midst members of a primitive society of unusual interest and of a high degree of intelligence, ingenuity and ability

as applied to the conditions of their original environment. It is very necessary to rescue from oblivion, before the complete absorption of their descendants into our civilization, all details concerning them and amongst these are those dealing with the healing art.

J. B. CLELAND.

(*Editorial Note:* The foregoing article formed the substance of the Campbell Oration delivered before the Anthrological Society of South Australia in 1951.)

New Guinea: Material Culture. Adam.

The Discovery of the Vierkantbeil or Quadrangular Adze Head in the Eastern Central Highlands of New Guinea.

By Leonhard Adam, LL.D., Department of History, University of Melbourne.

The stone implements discussed in this article are tools used by the present-day natives of a mountainous area situated roughly between 6° 10′ and 6° 40′ S. lat. and between 145° 10′ and 145° 50′ E. long. in the Eastern Central Highlands of New Guinea. They were collected by Ronald M. and Catherine Berndt during their 1951-1952 expedition. The collection is now in the Department of Anthropology, University of Sydney.[1] It includes approximately 140 implements belonging to four different types, referred to in this paper as types No. I, II, III and IV respectively. Mr. Berndt saw no perforated stone club heads in the research area. In the title, type No. II only is mentioned because it is probably the most important of the four categories, although type No. IV is also remarkable. Type No. I is a form which is well-known from other parts of New Guinea.

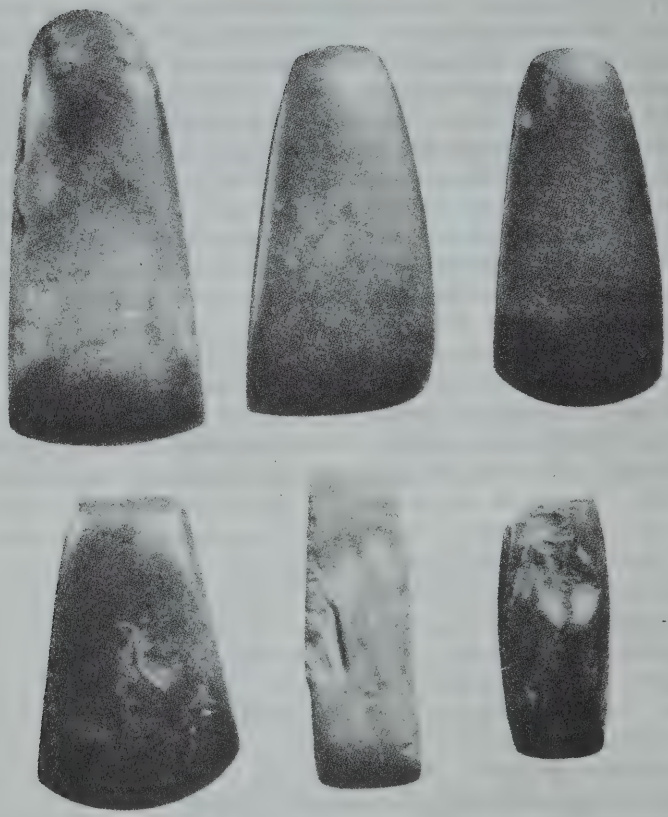
It is noteworthy that "all blades were obtained from natives who used them or had stored them away while using steel axes. None are what could be called 'obsolete.' No blades were found on or below the surface, and none are what could be termed 'prehistoric.'" Furthermore, all these types were hafted. Thus, while steel axes are now gradually replacing original implements, the technical equipment of these tribes is still, or was until quite recently, decidedly lithic. Mr. Berndt mentions that "the area had its first Administration patrol through in 1947 and was declared 'controlled' only in 1949-50." These dates are important in that they show that the distribution of implement types in this area,[2] at the time of the first R. and C. Berndt expedition, had developed independently of European interference.

"Quadrangular" axes have been known from the area situated roughly between 143° 10′ and 144° 30′ E. long. for some time, the most prominent, of course, being the so-called "Mount Hagen axe," with blades consisting of siliceous slate of light green, mottled green, black, or white colour. The various finds, all from districts lying west of the area of the R. and C. Berndt expedition, are reviewed in Chapter V of Alphonse Riesenfeld's handbook, "The Megalithic Culture of Melanesia" (Leiden, 1950), pp. 641 ff. The term "quadrangular axe, or adze" is somewhat misleading. It is an inaccurate translation of the original German term "Vierkantbeil," introduced into the technology and archæology of the Pacific area by Heine-Geldern. It does not mean that either the outer contour or a vertical cross-section

[1] I am indebted to the Head of the Department, Prof. A. P. Elkin, and to Mr. and Mrs. Berndt for kind permission to reproduce a number of specimens. All the data referred to in this paper have been supplied by Mr. Berndt, who also drew the sketch of the map. Only a few additions outside the marked research area have been made. The responsibility for the classification of type No. II, for technological details in general, and for the conclusion, is mine. While this article is being written, Mr. and Mrs. Berndt are back in the same area for further research. Before their departure, Ronald Berndt pointed out to me that, apart from the stone implement types described in this paper, other types, which are not used by the natives to-day, also occur in the same region. A paper by Mr. Berndt on "The Contemporary Significance of Some Prehistoric Stones," will appear in *Anthropos* (Switzerland).

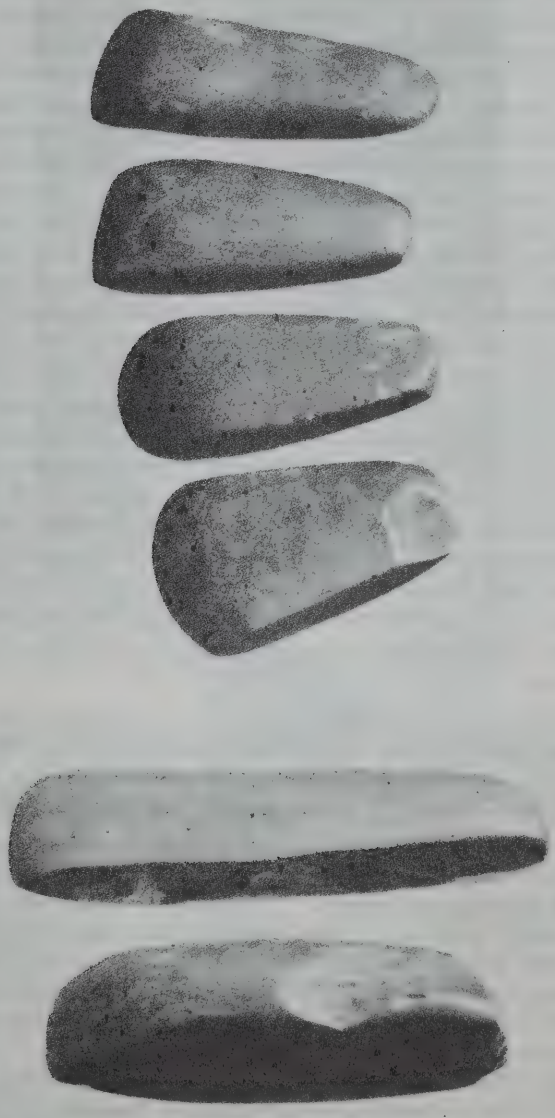
[2] The area is marked — · — · — · — · — on the sketch map.

VIERKANTBEIL FROM EASTERN CENTRAL HIGHLANDS, N.G.



Six specimens of type No. II, the quadrangular adze head ("Vierkantbeil") of the Eastern Central Highlands of New Guinea.
Photo.—*Department of Visual Aids, University of Melbourne.*

VIERKANTBEIL FROM EASTERN CENTRAL HIGHLANDS, N.G.



The six specimens of type II in three-quarter profile to show the straight vertical lateral surfaces (cheeks) and the biface bevel.

Photo.—*Department of Visual Aids, University of Melbourne.*

of an implement is quadrangular or rectangular, but that the object has four surfaces, one upper, one lower, and two lateral, forming four lateral edges, whereby the edges of each lateral surface meet at the end to form a corner of the cutting-edge. This means that a vertical cross-section through any part of the blade, and parallel to the cutting-edge, is not necessarily rectangular but that a variety of shapes is possible, especially where the upper surface, or both the upper and lower surfaces are more or less curved. It would be safer, therefore, to translate " Vierkantbeil " literally as " four-edged axe, or adze." whereby the cutting-edge is not included. The term " quadrangular " has nevertheless been used in the title because it has been accepted by some authorities, especially recently by A. Riesenfeld. Another general point must be clarified before we describe the four types, namely the definition and demarcation of an axe and, on the other hand, of an adze. The general opinion seems to be that an axe blade is hafted with the cutting-edge parallel to the haft, whereas the cutting-edge of an adze is hafted at right angles to the haft. Figure 2 is a drawing of a hafted specimen of type No. II, but it is probable that the other types may be hafted in the same way. Here, the rather flat blade and, implicitly, also the cutting-edge, is hafted at an angle of approximately 45° to the haft. This means that this hafting does not allow us to define the specimen as either an axe or an adze, or rather that it fits both classifications.

It is important that this oblique hafting at an angle of approximately 45°, as illustrated in Fig. 2, is not to be regarded as an exception but is the typical hafting method applied to all the hafted stone implements of the various types observed by Mr. and Mrs. Berndt and described in this article. This has been especially confirmed by R. M. Berndt in his letter dated Raipinka, Kainantu, January 4th, 1953. Mr. Berndt points out that the hafting at an angle of *ca.* 45° is so common and so well-established as the right method that it is employed even where the stone blade has been substituted by a piece of iron. Mr. Berndt also informs me that the hafting of the axe blade parallel to the handle does not occur in that area.

In the following description of the various types, No. I has been given the first place because it is the most common form.

Type No. I. It is the typical Papuan form (Fig. 1), the vertical cross-sections parallel to the chord of the curved cutting-edge being elliptical (Fig. 1B). The implement tapers towards the butt end. The material,[3] which is very dense and of a pale green colour, is probably silicified volcanic ash. The native name of the type is *ɛlɔ:na*, or *agɔ:reᵊnu*.

Type No. II (Pl. 1 and 2) represents " at least 25% of the whole collection of one hundred and forty implements." There is a variety of shapes and sizes but they all show the characteristics of a true four-edged (" quadrangular ") axe or adze, namely the shape of a flat blade (Pl. 2) and two perfectly plane and vertical lateral surfaces which are at right angles to the cutting-edge where the latter is straight (as on Pl. 1, E and F), or to the chord of the cutting-edge where the latter is curved as in the other (larger) specimens illustrated on Plates 1 and 2. Furthermore the two larger (upper and lower) surfaces are either flat or only slightly convex. All specimens have a biface bevel as can be distinctly seen on Pl. 2, where the pieces are shown in three-quarter profile. However, as in so many Maori specimens, the bevel has been smoothed down to a curved surface gradually inclining towards the cutting-edge. Of the six illustrated representatives of this type, only the piece marked on Pls. 1 and 2 as " A " has, on both larger surfaces, bevels which still show the original inclined plane, although

[3] The specimens discussed in this article have been examined by a senior member of the Geology School, University of Melbourne. Classifications of minerals are, however, based on superficial examination only, since proper mineralogical examination would have been impossible without damage to the specimens.

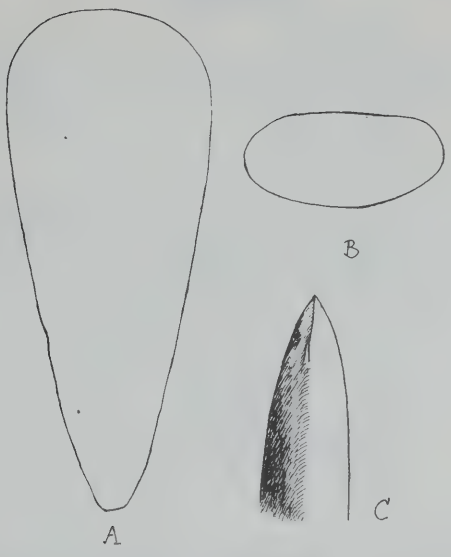


Fig. 1.—Ordinary adze blade, type No. I, of silicified volcanic ash of light greyish-green colour. Length, 19·25 cm.; width (chord of cutting-edge), 7·9 cm.; width of butt-end, 1·9 cm.; thickness, 3·5 cm.

A. *Outline of surface.* B. *Vertical cross-section in the centre.* C. *Profile of cutting-edge.*

Fig. 2.—Hafted specimen of type No. II, showing the cutting-edge at an angle of approximately 45° to the axis of the handle. Length of haft (including binding), 32·7 cm.; length from cutting-edge to wooden "heel" of haft, 26·6 cm.; binding material, split cane and bark.

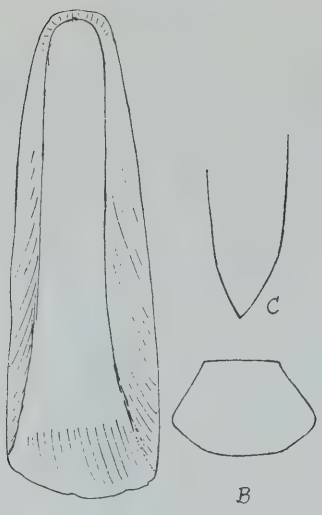


Fig. 3.—Type No. III, high-backed specimen, greenish-black stone, probably dolerite. Length, 19·2 cm.; width at cutting-edge, 5·9 cm.; width at butt-end, 2·5 cm.; maximum thickness, 3·7 cm.

A. *High-backed surface.* B. *Vertical cross-section.* C. *Horizontal cross-section showing biface bevel.*

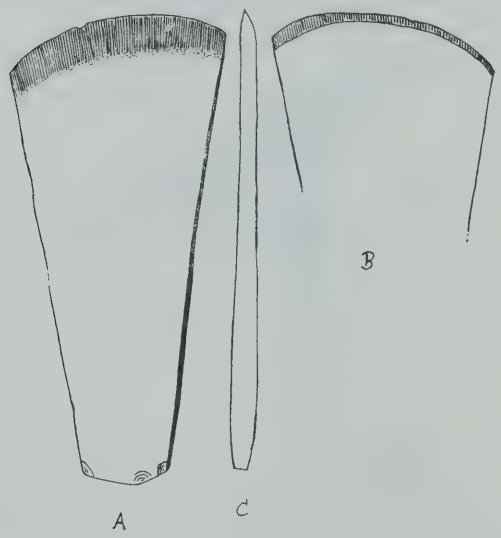


Fig. 4.—Minor Mount Hagen blade (type No. IV), black slate. Length, 18·15 cm.; width of cutting-edge, 8·5 cm.; width of butt, 3·4 cm.; thickness, 1·5 cm.

A. *Lower surface showing larger, gradual bevel.* B. *Edge of upper surface showing typical narrow, abrupt bevel.* C. *Outline of one of the perfectly straight and vertical lateral surfaces ("cheeks") showing biface bevel.*

here, too, the angle has been almost entirely ground down to a curved surface. The dimensions of the six specimens are as follows (measurements taken with calipers) :

Six Type II Specimens.	Length. (Centimetres.)	Width. (a) Of Cutting-edge or Chord of Edge. (Centimetres.)	Width. (b) Of Butt-end. (Centimetres.)	Thickness (Maximum). (Centimetres.)
A	16·3	7·6	4·6	2·7
B	14·4	7·5	3·8	3·0
C	13·6	6·5	3·5	2·9
D	11·9	7·9	4·5	2·7
E	12·25	4·15	3·3	1·9
F	9·9	3·4	3·9	1·75

These specimens were collected in the Kogu district, in the Usurufa linguistic group of the eastern Central Highlands, but they were not made there. They came from adjacent villages and districts in the Kamano, Jate and Fore linguistic groups of the same area (see map). Mr. Berndt adds that it was said that the majority were traded down from the area north of Kainantu, from the Agarabe people, neighbours of the Kamano linguistic group, toward the upper Ramu. The pieces are all of hard igneous rocks. Specimen *E* is of the same pale green material as type No. I, while the other representatives of type No. II are of a greenish-black material, dolerite or diorite. The colour of specimen C is a beautiful deep green. A comparison of the length and width of the six described specimens of this type illustrates the features of the sub-types. Specimen A is relatively flatter than B, C and D, but these four pieces are all more massive than specimen E, which is the narrowest and relatively thinnest of the series. Again, the specimen F is even shorter than E, but, in proportion, more massive. This piece, which is of a lighter grey material on the upper, only very slightly convex, surface but somewhat darker grey on the lower surface and on the lateral surfaces, can hardly be distinguished from a typical Maori chisel. At the same time, this piece seems to be very similar to a type used by the mountain tribe on the Otakwa, east of the Tjemara River, in southern Dutch New Guinea, illustrated by Le Roux.[4] It has already been stated that the upper and lower surfaces of the normal specimens of type No. II are either flat or slightly convex, but convex surfaces are predominant. This is, apart from the different rock material, the only perceptible difference from the average Maori adze blade of greywacke, or different kinds of greenstone. In Maori specimens, flat surfaces are the rule, while convex ones are the exception ; however, this difference does not apply to the smaller chisel type of both areas (New Guinea types, Pls. 1 and 2, E and F). This difference is not accidental but probably the result of different technical procedures in the manufacturing of these four-edged implements. It will be remembered that the Maori adzes and larger chisels

[4] C. C. F. M. Le Roux, *De Bergpapoea's van Nieuw Guinea en hun woonegbied*, Leiden (Brill), 1948. Vol. III (Atlas), Pl. XCIX, Fig. 1.5=Pl. CIV, No. 1. The hafting method is the same. It is the most common device in New Guinea. Unfortunately, there is no generally accepted term. Le Roux uses the name " kniebeji," while other authors compare the shape of the haft with a foot, whereby the stone blade rests on the " toe " and the extension at the opposite end represents the " heel." Again others prefer to speak of the " elbow " shape of the haft. Unification at an anthropological congress is desirable.

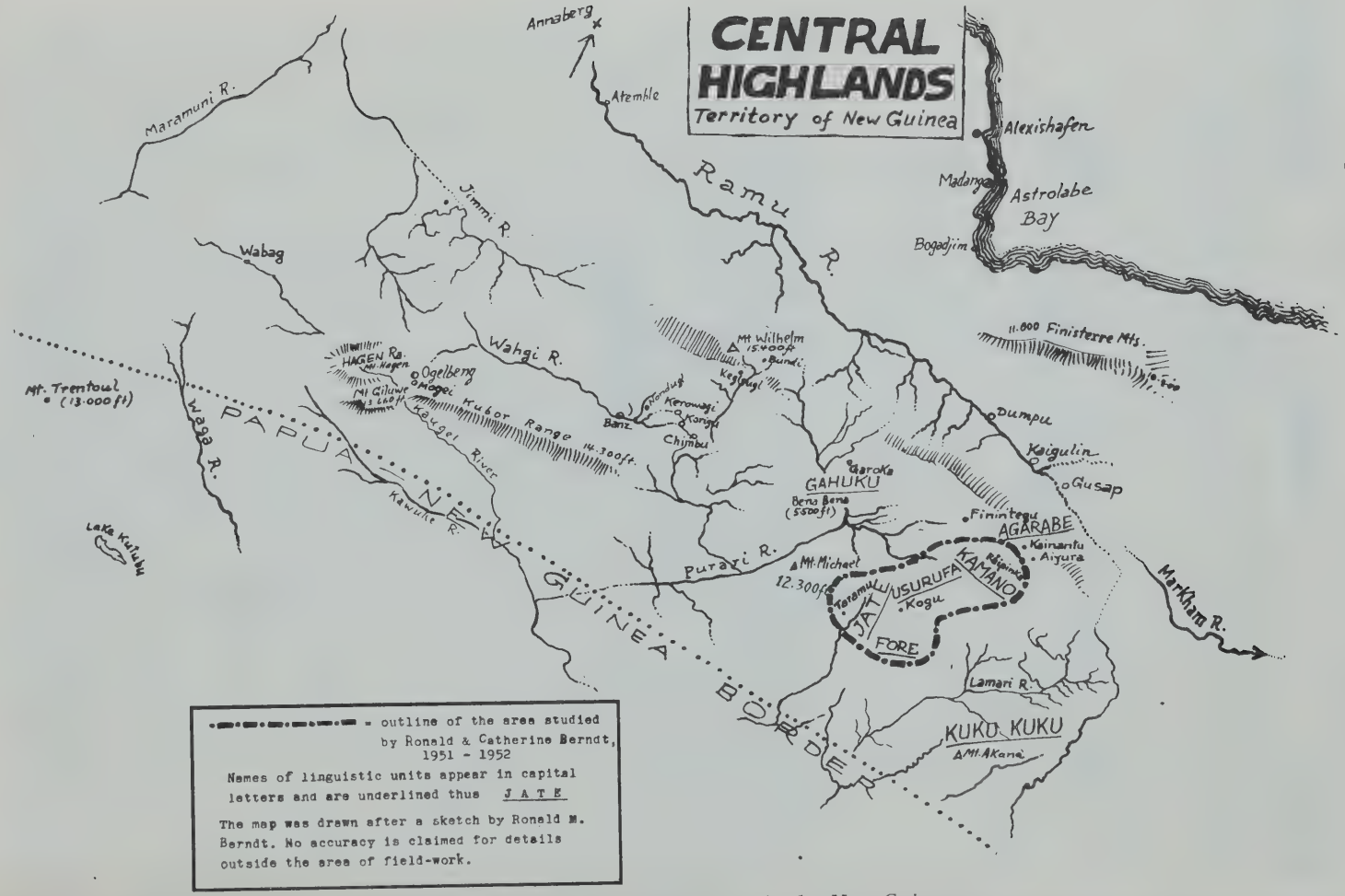


Fig. 6.—Sketch Map of Central Highlands, New Guinea.

are normally fashioned from a comparatively flat slab of rock by sawing, so that the plane vertical sides come about automatically through the sawing technique. So far, the manufacturing process of the four-edged New Guinea specimens has not been observed and recorded, so the method can only be tentatively suggested from the quality of the raw material and an examination of the surfaces. Le Roux, who distinguishes six principal types of stone axe or adze blades in New Guinea, regards the most common forms, viz. those with either elliptical or lenticular vertical cross-sections, as the prototypes from which the others were developed. He thinks that the types with more or less rectangular or trapezoid vertical cross-sections, including the Mount Hagen type, were produced by grinding off, either obliquely or straight vertically, the sides of rounded specimens with elliptical or lenticular cross-sections.[5] The correctness of this theory obviously depends upon the structure of the raw material. If the material occurs in flat slabs so that it has to be sawn to pieces, as in the case of so many Maori adze blades, the straight vertical lateral surfaces would be a primary development and there could be no question of a rounded piece with elliptical vertical cross-section as the original form. Apart from "sawing," some minerals, such as some varieties of slate, can easily be worked in flat pieces but are unsuitable to be ground down to massive forms, especially with curved surfaces. Thus before we consider the technical method by which an implement might have been fashioned, we have to study the way this particular kind of stone fractures. Slates with a laminated structure can be worked into flat blades, with plane sides at right angles to the cutting-edge, without first being ground in a different way. This holds especially good for the Mount Hagen axes, which consist of silicified volcanic ash or silicified slaty rock. But when the material is a waterworn pebble of a very dense rock, such as dolerite or diorite, the theory of Dr. Le Roux is plausible. In particular, it is acceptable with regard to the pieces of our type No. II. However, it may be correct only in so far as probably the larger, slightly convex surfaces were finished before the lateral, vertical ones, but it does not follow that the sides were first ground to a smooth rounded edge. In any case, Le Roux's theory is in agreement with Heine-Geldern's view, accepted by most prehistoric archæologists, that the types with round, oval, or lenticular vertical cross-sections are older than those with quadrangular cross-sections. Nevertheless, if we realize the importance of the quality of the rock material for the morphology of stone artefacts, it is perhaps wiser not to be too dogmatic about chronological sequences. The specimen shown on Pl. 1 and 2, letter E is a case in point. This piece, which consists of the same material as the pieces of type No. I (Fig. 1), has, like most of the other representatives of type II, and also like type I, several areas of cortex, but there is more cortex on piece E than on any other specimen here illustrated. There is cortex on the butt end, which, as can be seen on Pl. 2, has been ground vertically like the lateral surfaces ; but there are more cortex areas on all surfaces of this piece, notably on the sides or cheeks. The latter are not quite straight but, as can be seen on Pl. 1, rather wavy. This seems to exclude sawing as a manufacturing process. Furthermore, the specimen has a number of percussion scars, clearly visible on Pl. 1, only one of which, very small and recent, is on the cutting edge. It is obvious that this piece has been fashioned from a natural core or pebble, which had an accidental flat shape as is proved by the cortex on both the upper and lower surfaces. It is also obvious that the relatively straight vertical lateral surfaces must have been produced by the original trimming of the piece.

Type No. III (Fig. 3), consisting of a greyish or greenish-black igneous rock, probably dolerite, is a high-backed celt with four longitudinal edges which are rounded and smooth,

[5] Le Roux, *loc. cit.*, Vol. I, p. 415 f., and Fig. 8 (*c* and *d*) on p. 416.

except near the butt-end where they are more angular. A somewhat idealized vertical cross-section (Fig. 3, B) is roughly trapezoid. This piece, too, has many spots of cortex or, in this case, rather irregular cavities of the original natural surface, showing the yellowish-grey sediment of the soil. It is a transitional stage between type No. I and a four-edged type, narrower and longer but more massive than type No. II. A similar type was found by Le Roux in the environment of the Wilhelmina-top (*ca.* 138° 40′ E. long. and *ca.* 4° 15′ S. lat., west of the Baliem river in Dutch New Guinea[6]). It seems that, in the area studied by R. and C. Berndt, this type is less common than the other types described in this paper, and it is probable that it owes its distribution to intertribal barter, just like other implement types in New Guinea. It is particularly obvious in the case of this type that the pieces were fashioned in this way to provide a better and firmer grip for the binding of the haft.

Type No. IV (Fig. 4) is of special interest in that it is nothing else but a pigmy variety of the Mount Hagen axe blade. They come from the district south of Kainantu (see map) and are known under the name of *ɛli:lɔ:n'dum*. Mr. Berndt recognized at once that these are not really Mount Hagen axes, only similar, and that the difference lies not only in the size but also in the fact that the Kainantu specimens have, as he aptly put it, " more body." This is confirmed by the measurements, and also by the morphology, of these remarkable pieces. Mr. Berndt sent me two specimens. One of these is illustrated in Fig. 4. In the following diagram showing measurements, the specimen illustrated is referred to as " specimen (*a*)," while the other piece is " specimen (*b*)." The material is perfectly black slate, similar to, or of the same kind as, the siliceous slate used for the classical Mount Hagen axe blades. We may recall that the latter occur in four colours, viz. a pale green ; a mottled green, i.e. pale green with darker parallel streaks ; black ; and white. The Kainantu specimens are likewise found in various colours, viz. pale green, dark green, or black. Mr. Berndt saw no white specimens. For comparison between the two types, i.e. the classical Mount Hagen and the Kainantu blades, I have chosen a typical Mount Hagen specimen, i.e. one of moderate, or average, dimensions and thus not one of the, not uncommon, very large ones. It is a piece in the ethnographical collection of the University of Melbourne, pale green with darker,

Measurements of Two Specimens of the Minor Mount Hagen Blade (Type No. IV), Compared with those of a Classical Mount Hagen Blade.

	Length. (Centimetres.)	Width (Cutting-edge). (Centimetres.)	Width (Butt-end). (Centimetres.)	Thickness. (Centimetres.)	Breadth of Vertical Flank. (Millimetres.)
Minor Mt. Hagen Blade, specimen (*a*)	18·15	8·5	3·4	1·5	8·5
Minor Mt. Hagen Blade, specimen (*b*)	14·0	8·1	3·4	1·7	8·0
Classical Mt. Hagen Blade	25·6	12·7	5·5	1·4	9·0

greyish, parallel streaks. The main difference is that the classical Mount Hagen blade has a very narrow and plane *uniface* bevel which, on the specimen here described, has a breadth of no more than 2·5 mm., in most places only 2 mm., whereas the Kainantu pieces have biface bevels. The illustrated piece, for example, has an irregular, though narrow, plane bevel on

[6] Le Roux, Vol. I, p. 415, and Fig. 8 (*c*), p. 416.

one surface (Fig. 4, B) (breadth of this bevel, measured in three places, 6 mm., 3 mm., 2 mm.), while on the other surface there is a much broader bevel of 10 mm. breadth in one corner, 15 mm. in the other corner, and 20 mm. in the centre. Furthermore, this bevel is not abrupt (stepped: as on classical Mount Hagen blades, but is slightly convex. The other Kainantu piece shows traces of original narrow bevels on both sides, but they have been retouched and replaced by broader bevels such as illustrated in Fig. 4 (A). With regard to the thickness of the blades, a conspicuous feature of the newly-discovered type is a slightly greater thickness in proportion to the length and width of the whole blade, but the relative measurements vary. It is noteworthy that, in both the classical Mount Hagen pieces and the Kainantu specimens, the breadth of the vertical flanks, or cheeks, is always smaller than the maximum thickness of the blade (measured with calipers in the centre). Perhaps an extreme case is that of piece (*b*), where the maximum thickness is 1·7 cm., compared with only 8 mm. greatest breadth of the flanks. These figures indicate that the large surfaces of all these blades are not plane, but slightly convex. The appearance, however, especially that of the classical Mount Hagen axes, is flat, sloping towards the cutting-edge, so that the longitudinal vertical section is wedge-shaped. Then, on the real Mount Hagen blade, one surface does not reach the cutting edge but is separated from it by the extremely narrow abrupt bevel, forming with the surface an angle of about 150°. In most cases, the convexity of the surfaces can hardly be perceived visually but will be easily felt when handling the specimen. It is, however, more developed in the smaller pieces from the Kainantu area.

In spite of the differences, there can be no doubt that the smaller type is genetically related to the classical Mount Hagen axe blade. The peculiarities of the smaller type—two bevels instead of the single, uniface bevel of the larger variety ; grinding of the surfaces to curved bevels right down to the cutting-edge ; and relatively greater thickness of the specimens, compared with their smaller size—suggest that the makers have tried to adapt the Mount Hagen axe type to the probably older local type No. I. The same might have happened to type No. II, which might have had an abrupt, more typically Polynesian, bevel. Subsequently, the makers probably rounded the bevel as we see it on Pl. 1 and 2. On the strength of the morphological relationship of the two similar types, the classical Mount Hagen axe and the smaller specimens from the area south of Kainantu, it is advisable to introduce a corresponding nomenclature. For obvious reasons, any names formed with either " micro - " or " pigmy- " are ruled out in this case. I suggest to describe the type discovered by Mr. and Mrs. Berndt as the " minor Mount Hagen-blade." Mr. Berndt points out (letter from Raipinka, January 4th, 1953) that the minor Mt. Hagen blades are never hafted with the cutting-edge parallel to the handle, like the classical Mt. Hagen axe, but that the hafting method " resembles " the one illustrated in Fig. 2 and that it is an oblique hafting at an angle of approximately 45°. So far, Mr. Berndt has not seen the manufacturing of a minor Mt. Hagen blade. He writes : " Whether the minor Mt. Hagen axe is (or was) manufactured within the Kainantu sub-district I cannot discover. Some call it the ' Chimbu ' type, suggesting that it may have been traded from the west. On the other hand, it occurs frequently."

Conclusions

Before the discovery of the types Nos. II and IV, the classical Mount Hagen axes were completely enigmatical, especially with regard to their isolated existence in the Central Highlands of New Guinea. It is true that implements with more or less flat, vertical or

oblique, flanks had been known from a few other tribes and localities, but their local and purely technical origination, perhaps in the line suggested by Le Roux, could be considered. The discovery of type No. II, not as a limited number of isolated specimens but as an apparently well-established type, shows that there exists, in the interior of the eastern Central Highlands in recent times, a stone industry which is typologically closely related to the rectangular axe, or adze, types of Polynesia, south-east and east Asia. It may be recalled that, in the immediate neighbourhood of New Guinea, viz. in the Hermit Islands, west of the Admiralty Islands, adzes of *tridacna* shell, of typically Polynesian narrow rectangular form,

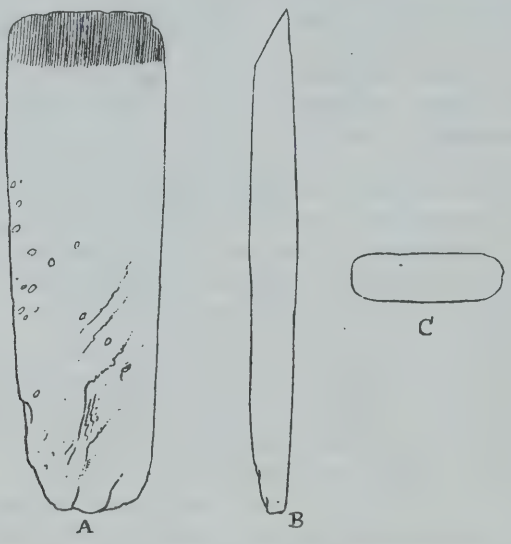


Fig. 5.—Adze blade of Tridacna shell with unilateral bevel. Length, 14·2 cm.; width of edge, 4·4 cm.; width of butt-end, ca. 3 cm.; thickness (maximum), 1·6 cm. Found buried 10 feet under the surface at Maron, Hermit Islands, 1929. (On loan in the Melbourne University Collection.)

A. *Surface showing the bevel (which is hatched).* B. *Profile showing the bevel (at the top of the drawing) in its position between the upper and lower surfaces.* C. *Vertical cross-section.*

with uniface bevel, were used. Figure 5 illustrates a good example which, according to the old hand-written label attached to it, was found buried ten feet under the surface at Maron, Hermit Islands, in 1929. The material is evidently very ancient, weathered and worm-eaten. The presence of people of Polynesian material culture, then, cannot be denied for the island area, which must have been at least one of the points of departure of the sea-borne tribesmen who, in prehistoric times, entered both the Sepik and Ramu estuaries and travelled upstream. There is no room here to review older theories in the light of the new finds. But it is certain that ancient cultural relations between Papuans, Melanesians and Polynesians, especially Maoris, can hardly be called in question any longer when more and more technical and formal similarities and even identities are discovered. A very important point, frequently overlooked in discussions of the problem, is the fact that the *bull-roarer* is quite a conspicuous feature in

the material culture of the Maori. It has been described and illustrated by Elsdon Best, Sir Peter Buck and others. The late Professor Felix Speiser apparently overlooked it and, consequently, put forward his theory that the ancestors of the Polynesians never went to Melanesia—an area where the bull-roarer plays such an important part in belief and ritual. The finds made by R. and C. Berndt are bound to revive and help to revise these and related theories. Discoveries of this kind may also stimulate the discussion of the genetics of Pacific art styles, including Maori art. In spite of conspicuous parallels, sometimes absolutely identical features, in Melanesian and Maori art, some scholars indulge in some sort of anthropological Monroe doctrine and emphatically deny that the decorative art of the Maori could have been influenced from Melanesia, let alone Asia. The first to hold such a view was the great Americanist, Karl von den Steinen. For a sound appreciation of the significance of parallels, it is useful to examine the areas in question on a globe, and also to study the sea currents. If we look at the specimens on Pls. 1 and 2, their relationship to Maori implements is evident ; but nobody would consider that the ancient Maori derived their stone implements from the eastern highlands of Central New Guinea. In other words, on the technological side we are inclined, in case of distinct parallels, to regard the Polynesians as the productive, the Papuans or Melanesians as the receptive element. There is no reason why the same should not hold good in the sphere of art also. Generally speaking, however, it is a fair assumption that influences were reciprocal.

L. Adam.

Australia : Social Anthropology. **Berndt.**

A Selection of Children's Songs from Ooldea, Western South Australia. *By M. Berndt, M.A. and Catherine Berndt, M.A., Department of Anthropology, University of Sydney.* (*Continued from Vol.* 4, *No.* 9.)

(45) *'wara:'bala:la: 'ulga:lenina: 'tji:beda: 'gura:*(*b*) *'wara:'bala:la:*
a long spear comes down (*a*) no good a long spear.

Notes.—(*a*) Little pieces of grass from the Spinifex bush.
(*b*) *'gɔra'məda.*

Explanation. The hunter throws a long spear, it passes through a Spinifex bush and attaches to a fragment of grass ; the spear comes down. The " throw " is no good.

(46) *'tjunda: 'ma:li:*(*a*) *'tjunda: 'benbu:lulu:*
foreleg kangaroo rat foreleg crush down a bush with the feet
'ga:di:(*b*)
take it (or carry away).

Notes.—(*a*) Usually *'ma:la* or *'mala.*
(*b*) Usually *'ga:diŋ* or *'ga:dinji.*

Explanation. With its foreleg wounded, the hunted kangaroo rat crushes down a small bush ; the hunter carries it away.

(47) *'munduŋu: 'neia: 'daŋana: 'puŋu:*
a head covering throw (?) wild cat hit it.

Explanation. A club is thrown at a wild cat, which is hit. *'munduŋu* may mean a camouflage of boughs worn by the hunter on his head.

(48) *'windi:la: 'nanba: 'wi:ruru: 'balwo'lu:du: 'doidjunju:*
a piece of stick in hair-belt/thigh (*a*) (*b*).

Notes.—(*a*) Cooking meat in the ashes. A depression is first scooped out and the animal placed therein ; it is then covered with ashes. When cooked this way the skin or fur of the animal is not removed.
(*b*) The act of throwing ashes in a *'wi:ra* or wooden dish.

Explanation. A piece of stick through a small animal acts as a bar when threaded through the hair-belt for carrying. When the hunter walks, it knocks against his thigh. He cooks the meat. A dog tries to pull it out of the fire, he throws ashes at it.

(49) *'di:bida: 'ŋa:bidi: 'ḍa:*(*a*) *'mara:*(*b*) *'mara: 'ḍa:*
scab an exchange of meat a burrow get hold of a burrow.

Notes.—(*a*) Lit. meaning " mouth."
(*b*) Lit. meaning " hand."

Explanation. There is an exchange of meat between one man and a stranger with a scab (possibly scar). First they catch small animals from a burrow for this purpose. This food exchange cements their bond of friendship.

(50) *'walga: 'rɛri:'rɛri: 'ŋenda: 'dagu: 'walga:'djuna:*
marks shivering with cold a big snake/tell you/marks/put it down
'jara: 'walga: 'linda:
a white-blossomed tree marks to throw sand with one's hand.

Explanation. A man is shivering with cold ; he sees the tracks (marks) of a big snake. He tells another man ; together they follow the edible snake and kill it near a white-blossomed tree. The last word of the song refers to the digging of a depression in the sand in which to make a fire for cooking the snake.

(51)[12] *'ma:gu:'ilbura: 'gura: 'buŋa: 'lindɛ'rɛri: 'lindɛ'rɛri:*
witchetty-grub/in big tree rub hit brush sand aside brush sand aside.
'ma:gu:'ilbura:
witchetty-grub/in big tree.

Explanation. The song refers to the obtaining of the *'ma:gu* or *'ba:di* grub from the roots of a tall tree. Many such fine trees have been " grubbed," but do not always die, since one side only of the roots may be dug out.

(52) *'wara:la:*(*a*) *'ŋa:rala: 'wɔnanu: 'wi:djin'bɔri: 'wi:*
a deep waterhole/stand up chase them (*b*) hungry.

Notes.—(*a*) The name of this particular waterhole ; the word *'ga:bi* is the general term for water.
(*b*) Twisting and bending a spear over a fire to make it straight.

Explanation. At a deep waterhole a hunter pauses to straighten a spear over a fire ; he continues to hunt since he is hungry.

(53) *'tju:ra:'bidi: 'maraŋ 'gu:lanu: 'tju:ra:'bidi:*
digging in the sand get him smooth over the sand/digging in the sand/
'maraŋ 'gu:lanu: 'tju:ra:'bidi:
get him smooth over the sand/digging in the sand.

[12] *Re* our report, *op. cit.*, Vol. XIII, No. 2, under the heading of " Socio-economic Activities," or *Oceania Reprint, op. cit.*, pp. 61-73.

Explanation. This song refers to the digging out of a small marsupial; the sand is smoothed over afterwards.

(54) *'tju:ra:'bidi: 'ŋaiəgu:la: ! 'tju:ra:'bidi: 'ŋaiəgu:la: !*
dig in sand That is mine ! dig in sand That is mine !

Explanation. This song (as No. 53) refers to the digging out of small marsupials for food.

(55) *'wala:'wala: 'bandja: 'ŋaiəgu:la: ! 'bandja: 'wala:'wala: 'bandja:*
spear (*a*) That is mine ! (*a*) spear (*a*).

Note.—(*a*) On many desert water-holes and rock-holes a scum forms. *'bandja* means to put fine acacia, or other leaves from a bush, on that water so that it may be drawn through this sieve and purified.

Explanation. The song refers to a group of hunters; the word *'ŋaiəgu:la: !* may mean, " It is my right to have the first drink ! " This song is danced by women in a " play-about " ceremony after a hunting expedition. The song is sung very quickly. Children have learnt it, as they are often present during these evening *'inma*, and sing it in their own *'inma*.

Pertaining to Animal and Bird Life, etc. (apart from hunting activities).

(56) *'deru'deru: 'wɔŋa:*(*a*) *'ma:ni: 'ga: 'deru'deru:*
green parrot speaks — — green parrot.

Note.—(*a*) Also *'wɔŋgai.*

Explanation. The green parrot speaks. The word *'ma:ni* may have supplied a key to the significance of this song, but the informant could not translate it.

(57) *'baba: 'tjəruŋ'daula: 'mɛraŋda: 'wɔŋari: 'jɛri:*(*a*)
dog sheet clouds to call out to attract attention one wood bark.

Note.—(*a*) Also *'bi:luru.*

Explanation. The dog is like sheet clouds; it howls to attract attention. Here is a piece of wood bark.

The significance of the last two words and their relevance to the first part of the song was not known by the informant.

(58) *'ji:wugu:'tjunu: 'da:laŋ'gara: 'ʒunda:*(*b*) *'bi: 'djara:*
slither/put it down a small lizard(*a*) thigh skin walking with feet turned outwards.

Notes.—(*a*) The small sand lizard of light colour.
(*b*) Also *'dʒunda, 'djunda.*

Explanation. The small lizard slithers over the skin of a boy's thigh, with its feet turned outwards; he does not like the sensation of the tickling of the lizard's feet, and puts it down.

(59) *'bunba:'bala:la: 'tjeda:ri: 'wɔŋana: 'wɔŋana:*
the bell bird(*a*) (*b*) we talk we talk.

Notes.—(*a*) Described by informant as " a little grey black-breasted bird." The bell bird is usually termed *'banban'barila:* or *'bʌnbʌn'bʌrila:.*
(*b*) White dog's excreta.

Explanation. The bell bird is sitting near (or on) the excreta of a white dog. " We talk," i.e. the man and the bell bird.

This is a most interesting song as it is probably associated with the mythology. In the *'wanmala* cycle of songs the bell bird makes an appearance—it is associated with " war " expeditions. It has the power of speech and a participant in the *'wanmala* may hear it talking.[13]

The children, of course, sing this song without realizing the mythological and *'wanmala* importance of the bird.

(60) *'da:raŋa:*(*a*) *'gulumba: 'gɔlgura:*(*c*) *'ŋa:lala: 'jala:'riŋu:* ? *'da:raŋa:*
cat little(*b*) run away come along which way go ? cat.

Notes.—(*a*) *'da:ŋa, 'da:rŋa* or *'darŋa.*

(*b*) Meaning " young " (also *'gulin*(*ba*)).

(*c*) Lit. " going back " ; " running away " is usually *'wɔlariŋu·*

Explanation. A kitten (of the wild cat) runs along, comes along. Which way did that kitten go ?

(61) *'ði:ði:*(*a*) *'ŋarni: 'djara: 'gurara:'gurara: 'muldju: 'wɔniŋi:*
boy (*b*) (*c*) two trees white pipe-clay(*d*) throw away.

Notes.—(*a*) Usually *'ḍi:djı* or *'ḍi:ḍi.*

(*b*) A big frog containing water in its belly. The frog is dug out from a clay pan, and by compressing its urinary bladder water is obtained.[14]

(*c*) Walking with one's feet turned outwards.

(*d*) Used to make marks (*'walga* or *'wɔlga*) on the body.

Explanation. A boy finds a *'ŋarni* near two trees at a place where pipe-clay is obtained ; he then throws it away (after having drunk its water). The relevance of the word *'djara* is not known.

(62) *'ja:ri:'amblu: 'ŋurai 'ja:ri:'amblu*
arm/flower(*a*) a white bird arm/flower.

Note.—(*a*) A flower stuck through an arm-band.

Explanation. The white bird is considered as beautiful as the flower (a white " everlasting ") in the arm-band of the singer.

(63) *'tjindja:'tjindja: 'kulum'ma:ra: 'banba:*(*b*) *'ta:da:*
willy wagtail(*a*) eyes/hand bell bird (*c*).

Notes.—(*a*) Usually *'tjinta'tjinta* or *'dzinta'dzinta.*

(*b*) Usually *'banban'barila.*

(*c*) Making a noise or click on one's thigh with the nail of the thumb and the index finger, the latter being just behind the former.

Explanation. The click made by the fingers is said to attract the birds that one sees (i.e. eyes). These two birds, the bell bird and willy wagtail, each have their own myth. The bell bird, apart from its significance mentioned in song 59, has a musical call that is considered by the natives to be very beautiful during the daytime ; but at night its cry—very rarely heard—portends a " war " or revenge expedition and is disliked. The willy wagtail is considered a mischievous bird and a great gossiper. The children know the above characteristics of the two birds, but not the myths or secret (i.e. adult) songs centred around them.

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[13] I.e. the " fighting expedition." See our report under the heading of " *'Wanmala,*" *Oceania, op. cit.* Vol. XIV, No. 2, pp. 127-129, or *Oceania Reprint,* pp. 175-177.

[14] *Vide* R. M. Berndt and T. Vogelsang, " The Initiation of Native-Doctors, Dieri Tribe, South Australia," *Records of the South Australian Museum,* Vol. VI, No. 4, p. 378.

(64) *'jeli:ŋa:*(*a*) *'ganba:di:*(*b*) *'walu:na: 'jeliŋ'ganba:di:*
hole/place a silver-green snake run hole/snake.
Notes.—(*a*) Usually *'jala.*
(*b*) Usually *'ganba* or *'kanba* ; a term referring to a snake of any species.
Explanation. A snake is seen near its hole, the one seeing it runs away.

(65) *'baba: 'wi:bu: 'da:ga: 'ələrla:'riŋa: 'wəniŋ'wəniŋ 'nadju: ! 'bandəna:*
dog's tail skinny (and) close up dry meat No ! sniffing.
Explanation. The dog's tail is skinny and short (i.e. " close up "). There is dry meat for it, it sniffs but does not eat (i.e. No !).

(66) *'ŋinbi: 'dəri: 'wana: 'gaduŋa: 'mailiŋ'buna:*
eyebrows green bird water of creek top of hut/big.
Explanation. A green bird " with eyebrows " rests on the top of a large hut near water.

(67)[15] *'baba 'ŋuriŋ'ŋuriŋla: 'ŋurilba: 'i:lu:'dangu:*
dog find it close(*a*) dead/it was.
Note.—(*a*) " The other side of the sand-ridge."
Explanation. A boy spears a rabbit as it runs over a sand-ridge ; the dog fetches it.

(68) *'wala: 'ŋaraŋ'ŋaraŋ ma:'wi:di: 'ŋoa:'ŋoa:*
run noise made by animal run fast make a noise.
Explanation. A boy runs quickly away at the noise made by an animal ; he also makes a noise.

(69) *'wala:'wuru:*(*a*) *'munga:ru: 'gandunu: 'jɛri:'rɛri: 'wala:'wuru: 'munga:ru: 'gandunu:*
eaglehawk a long way (*b*) sharp eaglehawk a long way (*b*).
Notes.—(*a*) Usually *'waltja.*
(*b*) To beat on the sand with the sole of one's foot.
Explanation. The informant was not aware of the meaning of this song.

Songs Expressing a Knowledge of Secret, Magical or Religious Matters (also including songs mentioning initiation ; all sung out in the bush, away from the hearing of adults).

(70) *'wi:l-luŋ'guru: 'puŋku:lu:*(*b*) *'wandi: 'darbu:*
(*a*) hit him leave him alone/swearing.
Notes.—(*a*) To make marks on the body with pipe-clay.
(*b*) Also *'buŋgu:la.*
Explanation. The significance of this song is not known to the singers. The song hints at a *'ʧina:'ga:bil* (or revenge) expedition to perform a ritual operation on a victim who is designated " murderer."
The *'ʧina:'ga:bil* party have their bodies marked with pipe-clay, they hit the victim and later leave him alone. After the victim is revived he returns to his camp and there begins " swearing " (i.e. uttering sacred names profanely and in public) ; after three days he dies.

(71) *'jina: 'di:di:di: 'ga:gal 'badana: 'mungara: 'unmi:'buŋa:*
sitting down/(*a*) (*b*) bite east way (*c*).

[15] *Re* our Report, Vol. XIII, No. 2, under the heading of " Socio-economic Activities," or *Oceania Reprint, op. cit.*, pp. 61-73.

Notes.—(*a*) To " walk " along on one's knees.
(*b*) To make a peculiar inarticulate sound.
(*c*) The act of scraping up sand with the hands.

Explanation. This song seems to refer to an adult's totemic ceremony. The *'di:di:di:* and *'ga:gal* would be the actions of the participants.

(72) *'ja:ri: 'bala:'guralu: 'gu:li:'gu:liŋa: ! 'ma:ban'guralu:*
arm go away/cover up hear ! " spirit "(*a*)/cover up.

Note.—(*a*) The boy informant of fourteen years said that the *'ma:ban* was a white coloured " debil-debil " (malignant spirit) from the Spinifex ; sometimes it may be a stone—" it comes with the strong winds and breaks trees." Obviously the boy did not know what a *'ma:ban* was. Such *'ma:ban* are pearl-shell discs which are the peculiar property of native doctors (and sometimes *'ma:mu*, spirits) and one of their usages is curative.

Explanation. Go away and cover up the *'ma:ban* with your arm. Hear this !

(73) *'wɔŋga'nela: 'ju:na: 'buldara: 'la:ni:'la:ni: 'bi: 'la:ni:*
(*a*) go out don't know(*b*) circumcision flint(*c*) foreskin
circumcision flint.

Notes.—(*a*) Means " bush man "—referring to a novice who is taken out into the bush to be " made " into a man. A *'wɔŋgrua* is one who is serving his period of seclusion after circumcision.
(*b*) This refers to the fact that the youth does not know where he is going.
(*c*) This is an alternate name for *'kandi*, a flint knife.

Explanation. A " bush man " goes out of the camp ; he does not know where he is going. His foreskin will be removed with a flint knife.[16]

(74) *'bulpi:'bulpi:*(*a*) *'bi:ga:ra: 'jana: 'walba: 'ða:*(*b*) *'di:gara: 'jana:*
bull-roarer sore gou yo away/wind lips bark of tree go away.

Notes.—(*a*) Usually referred to as *'pu:pi:'pu:pi:*, a bull-roarer ; the word is a derivation of the sacred word *'pu:biŋ*. The informant translated this word as " the noise that the bush man (during initiation) makes " ; the " noise " means the hum of a twirling bull-roarer that can be heard for a great distance in the stillness of the night.
(*b*) Usually *'ḍa*, lips or mouth.

Explanation. The song refers to the period of seclusion after circumcision when the bull-roarer is used. His penis is still sore—the wind is cold and he tells it to go away.

(75) *'djaŋura: 'ŋuga:'ranani: 'wɔŋga:ba: 'gumbana: 'ŋuga:'ranani:*
big hill eat it all up (*a*) face blackened with charcoal eat it all up.

Note.—(*a*) A *'wɔŋgura* or " bush man "—a novice who has been circumcised.

Explanation. The novice, camped at a big hill (i.e. in seclusion), is hungry and eats all the food given him. His face is blackened with charcoal.

(76) *'ju:djana:'landaŋu: 'ma:banba: 'bandana: 'ju:djana:'landaŋu:*
spear/a " boss "(*a*) (*b*) " flying quickly "(*c*) spear/a " boss "
'ma:banba:
(*b*).

[16] See our Report under the heading of " Initiation," *op. cit.*, Vol. XIII, No. 3, pp. 255-272, or *Oceania Reprint*, pp. 89-106.

Notes.—(*a*) A totemic or camp " boss " or head-man.

(*b*) In this context the word *'ma:banba* (which is really a pearl-shell) may be translated as *'ma:duki* (or *'maduki*), a magical object of the bull-roarer variety. See our *Report* under the heading of " Magic," *op. cit.*, Vol. XIV, No. 2, pp. 124-149, or *Oceania Reprint*, pp. 172-197.

(*c*) Referring to the twirling *'maduki*.

Explanation. The " boss " has a *'maduki* tied on the end of a spear ; it is twirling quickly.

The word *'maduki* should not be known to the children, as a special initiation into its use and magical function must be gone through by fully initiated men. This will explain their use of the term *'ma:banba* instead of the correct one. It would be interesting to know how their knowledge of the " swinging " of the *'maduki* was obtained.

Pertaining to Spirits.

(77*a*) *'ma:mu: 'ŋi:ni: 'nurpa: 'luma:'luma: 'ŋanbi:'ŋanbi: 'njina:ni:*
" debil-debil " bird(*a*) — to hit the ground(*b*) dance(*c*) sit down.

(77*b*) *'ŋi:ni: 'lurma:'lurma: 'ŋanbəri:'ŋanbəri: 'ma:mu: 'lurma:'lurma:*
bird(*a*) (*b*) (*c*) " debil-debil " (*b*).

Notes.—(*a*) The *'ŋi:ni* (or *'ŋeni*) *'ma:mu* seems to be of *'tju:kabi* origin, as no mention of it appears in dreams or stories of to-day. It is said by the elders that *'ma:mu* sometimes assume the bird shape of *'ŋi:ni*.

(*b*) To bow up and down hitting the ground with the head as if wailing.

(*c*) To dance in a jumping manner with one's hands on the hips, legs apart and knees bent.

Explanation. The small bird *'ŋi:ni*—the " debil-debil "—bows up and down and begins to dance ; then sits down. The children merely know the name of the " debil-debil," but not the mythological significance. This song is also sung by men going through their initiation. A variation of the same song, associated with a rite performed by two people to keep away the spirit, has been noted under the heading of *'Ma:mu* in our *Report*.

(78) *'baŋa:la:ŋ 'ɳada:ri: 'ma:mu: 'ŋi:nu: 'gu: ŋo'rayu:*(*b*)
got no name strange man spirit (*a*) gone stand up.

Notes.—(*a*) May possibly be the same bird called *'ŋi:ni* ; the *'ŋi:nu* was described as a small white bird with a long tail.

(*b*) A dialectical difference of the word *'ŋa:rala*.

Explanation. A stranger who has no name comes into the camp. He is believed to be a *'ŋi:nu'ma:mu*. Apparently he sits down, then stands up and goes away.

(79) *'ŋu:ra: 'bagena: 'gara'ŋa:ni: 'ruŋgal'ruŋgal*(*b*) *'nɛ ri:'naranu:*
camp a grain of sand (*a*) hit him (*c*).

Notes.—(*a*) " Sun shining on the hair of one's head." This means that there is something shining on the forehead of a *'ma:mu*. An adult would know this to be a *'ma:ban* pearl-shell and the *'ma:mu* to be a *'kinkin* (native doctor).

(*b*) *'ruŋga:ni*, to hit ; the use of *'ruŋgal'ruŋgal* means to hit several times.

(*c*) Refers to strange noises made at night by *'ma:mu* on the fringe of the main camp.

Explanation. Strange noises are heard about the camp—it is a *'ma:mu*. Try and hit him (otherwise he may bite and take away some small child). The word *'bagena* refers to *'gara'ŋa:ni* ; as a grain of sand glistens in the sunlight, as does a pearl-shell.

(80) *'muŋgara: 'da:rara: 'runmi: 'buŋu: 'njena: 'degi:'degi: 'ga:galgu:'badana:*
the other side (*a*) (*b*) hit it sit down (*c*) coughing/bite them.

Notes.—(*a*) Pointing to a certain direction.
(*b*) To brush aside sand with one's hand.
(*c*) Dancing in a haunched position while moving forward.

Explanation. The camp people can see a *'ma:mu* dancing towards them ; it coughs—it will bite them. The use of the word *'runmi* is not apparent.

Songs of 'Wɔnambi.

Children know of the existence of the mythical monster *'Wɔnambi*, called also the Great Snake. They say he is very large with a huge mouth and sharp teeth ; he has broad shoulders with a " mushroom-shaped " head set upon them. He is sometimes multi-coloured, looking like the rainbow (although he is not connected with it). The children and young men say that he lives in creeks and water-holes and that his home is *'Wandu:'ga:bi* (about thirty miles to the north in the Spinifex). When he emerges from the water he makes loud " blowing " sounds or again as if a great number of people were all clapping hands at the same time. He is believed to swallow small children who go near his home.

This is as much as the child, youth, or partly-initiated man knows—and is the common profane view. On the other hand there is an interesting mythology connected with *'Wɔnambi*, and in certain *'tju:kabi* myths he is associated with important totemic ancestral beings. Along with these there are ceremonies and sacred songs which are accessible only to the fully initiated man. *'Wɔnambi* has also another important function as the " patron " of *'kinkinba*, playing a major part in the initiation of native-doctors.[17] This latter significance is not known to the ordinary men.

'Œɔnambi is not only mythical but eternal, as are the ancestral beings ; he lived in the past (*'tju:kabi*) and is living in the present and will continue to live as long as Ooldea aboriginal culture persists.

The following songs are sung by the children about *'Wɔnambi*. They seem to be corruptions of songs associated with the adult mythology, but their origin is difficult to discover. Such songs would be taught to the children by their grandparents.

(81) *'wɔnambi: 'bala:*(*a*) *'ka:bi:'ka:bi:*(*b*) *'wɔni: 'wɔnanu: !*
the Snake stick water follow tracks (you) go with (him) !

Notes.—(*a*) *'bala* has several other meanings, demonstrated in other songs mentioned in this paper. The principle is that the meaning of the word depends on its context.
(*b*) Usually *'ga:bi* or *'gabi*.

Explanation. *'Wɔnambi* lives in the water near that stick. You follow his tracks and go with him ! (i.e. if you follow his tracks he will swallow you).

(82) *'wi:ra:'wi:ra: 'wɔna:'wɔnanu: 'wɔni: 'wi:ra:'wi:ra: 'wɔnanu:*
wooden dish throw away/follow throw away/wooden dish follow.

Explanation. This song, although sung by the children and said to refer to *'Wɔnambi*, has no deeper meaning for them. To understand its significance one must know the sacred mythological story of *'Keniga* (native cat), *'Mu:rulu* (grey rat) and the two *'Wɔnambi*. The wooden dish in the song refers to the fact that *'Mu:rulu* used this receptacle for carrying the *'Wɔnambi* which she stole from the *'Keniga*. Later she accidentally tipped over the *'wi:ra*

[17] See our Report under the heading of " Initiation of Native-Doctors," *op. cit.*, Vol. XIV, No. 1, pp. 58-62, or *Oceania Reprint*, pp. 160-4.

the water from which, with the help of the two *'Wɔnambi*, formed the Fitzroy River in the Kimberleys (north-west Western Australia). The tipping over of the *'wi:ra* is referred to by the word *'wɔni* ; and *'wɔnanu* means the flow of the river, following on.

(83) *'wɔnambi: 'ga:bi:'ga:bi: 'wɔnəra: 'wɔnanu:*
the Snake water/water coming behind following.

Explanation. The water is flowing ; the *'Wɔnambi* is coming behind.

(84) *'wɔna:'wɔnaŋa: 'na:du: 'buŋula: 'wɔni: 'wɔnəra: 'wɔnanu:*
(*a*) gets hold of people hit him throw away get him and come back follow back.

Note.—(*a*) Refers to the " big water," the sea down south of Ooldea. It is said by some that here *'Wɔnambi* lives.

Explanation. He lives in the sea down south ; he gets hold of people. Hit him, throw his body away ; " get him " (i.e. kill) and follow your own track back (i.e. home).

Erotic.

(85) *'miŋgeii:*(*a*) *'du:da:dara:*(*b*) *'paga:ra:*(*c*) *'ma:gulba: 'miŋgeii:*
women many stand (or get) up go on back(*d*) women
'ŋanaba:'tji:dun 'muŋa:'muŋa: 'kulu:(*g*) *'ŋa:wi:*(*h*) *'puda:*
(*e*) very early morning(*f*) eye tail (*i*).

Notes.—(*a*) Usual word *'minma*—the other is probably a dialectical difference.
(*b*) Usual word *'durda.*
(*c*) Usually *'baga:ra.*
(*d*) Referring to the position the woman takes for coitus ; the word was said to be synonymous with " sleep " (usually *'gungun*).
(*e*) This word refers to the penis as well as to the act of coitus.
(*f*) Or " just before day-break "—*'muŋa,* dark or night-time.
(*g*) Usually *'gɔ:ru* or *'guru.*
(*h*) A symbolic reference to the penis.
(*i*) The informants did not know the meaning of this word.

Explanation. The song infers that many (most) women lie on their backs during the night and are copulated with. The word *'muŋa'muŋa* refers to the hour when " sweethearts " (*'wɔnidjara,* " fancy girl ") leave their lovers' sides to return to their legitimate sleeping places. *'kulu:'ŋa:wi,* " the eye (sees) the tail," means that then one may see the man's penis hanging slack " like a tail."

It is important to recognize that children at an early age have a fairly comprehensive knowledge of the function of the male and female genital organs. For further reference to this subject see our *Report* under the heading of " Childhood," *op. cit.*, Vol. XIII, No. 2. This, with other erotic songs, is sung away from the camp out in the bush ; the boys' ages vary from eight to fifteen years (sometimes up to seventeen years). At times girls, whose ages vary from eleven to fourteen years, are present and join in the song ; the older boys sometimes have erections, caused not only by the inference of the song but by erotic play and by references made by the older girls. Children may pair off and lie together, indulging in various intimacies ; but the youth rarely takes the liberty of having coitus with her. The latter may happen later, when or if they enter into a *'wɔŋi* relationship (permitting pre- and extra-marital licence) with one another, or after the girl has her hymen cut at her initiation (see footnote 11 of this paper).

(86) *'uŋga:'uŋga:li: 'bara: 'maiju:*(*a*) *'a:wuru: 'bandela:*
a woman's name a large spinifex tree sings side of one's body smell
'maŋgu:duŋu: 'tja:raŋ'gara: 'wi:ʧu:'wi:ʧu: 'tjaltu:'lɔ:ru: 'guna: 'maiju:
eyes/two look thin thighs little red flower buttocks(*b*) sings
'uŋga:'uŋgali:
a woman's name.

Notes.—(*a*) *'maiju* or *mai'a:li* also means to hit with a stick on the ground during rhythmic chanting.

(*b*) Also refers to excreta, anus, or sometimes vulva.

Explanation. The context of this song is interesting and seems to have originally been of love magic intent. It is impossible to speculate how it came into the possession of the boys.

The song refers to a woman (who is unidentified either in the present or the *'tju:kabi* times) who sings by a large tree. *'a:wuru* means that she lies on her side for coitus, while *'bandela* infers that her lover is attracted to her by her odour (another informant said that the attraction lay in the smell of the woman's vagina)—he sees her with his two eyes ; he looks and sees her thin thighs, the red flower she wears in her hair, and her buttocks. This song is sung in the same circumstances as is No. 85.

(87) *'tjunku: 'wi:ru'wi:ru 'dalwi:gu: 'wana: 'badju: 'ŋa:ri:*(*b*)
bird feathers/front of thigh/— digging-stick(*a*) go with him lie down.

Notes.—(*a*) An implement used only by women, varying in length from five to six feet, pointed at one end.

(*b*) Also *'ŋa:rira* or *'ŋa:raŋu.*

Explanation. The feathers are worn by a man to make himself " pretty " so that he will attract a certain woman ; he has also stuck feathers on to his thighs. The digging-stick signifies the woman, while in the latter portion of the song the singer suggests that the woman should go and lie with the man.

As well as being sung out in the bush by children and accompanied by erotic play, this song is sung at night during an *'inma* arranged by the children near their own camp.

(88) *'lera: 'waru:'waru: 'ŋala: 'gura: 'benbuŋ*
little leaf two fires forehead no good erect penis.

Explanation. " A little leaf " refers to one given to a lover by his sweetheart. The singer is cold, he has no woman, so he builds a fire on each side of him and lies down to rest between them. *'ŋala'gura* signifies that his head aches. His penis is erect as he thinks of his *'wɔni'djara.*

The origin of this interesting song was not known ; it may possibly have been illicitly borrowed by the children from adults who practised love magic. This song falls into the same category as do numbers 86 and 87, and is sung away from the main camp sometimes in the company of girls.

(89) *'ŋa:li:*(*a*) *'gula: 'banda: 'wada:'wada: 'banda: 'ŋa:li:'gula:'banda:*
lie down (*b*) by bush tree stump by bush lie down/(*b*)/by bush.

Notes.—(*a*) Usually *'ŋa:rira.*

(*b*) *'gula* or *'gula'gula* is, briefly, a person—man or woman—who is " hungry for continual coitus." See our *Report,* Vol. XII, No. 4, p. 325, or *Oceania Reprint,* p. 21.

Explanation. According to the informant a man tells a *'gula'gula* woman to lie down in the shade of a bush and a tree-stump so that they may have coitus.

(90) *'galwa: 'ŋa:li:'leŋa:ri: 'milga: 'darana:*
neck (*a*) vagina dig up sand.

Note.—(*a*) Alternative to *'ŋaliŋa:ni* meaning to shake one's head from side to side with tongue protruding while laughing.

Explanation. A youth is laughing and making erotic suggestions to a girl ; he digs out sand, making a cool place on the damp surface, so that they may lie together.

(91) *'gal-lala:'gal-lala: 'la:na: 'djuruŋa:*(*a*) *'ŋa:ri:'ma:na:*
morning time put down fire carry/buttocks.

Note.—(*a*) Usually *'waru* or *'wa:ru.*

Explanation. It is morning time. He puts down his fire-stick ; then lifts the buttocks of his wife for coitus.

(92) *'ŋindji: 'bada:ra: 'jambu:'jambula: 'ŋindjə'rəri: 'ŋindji: 'bada:ra: 'jambu:'jambula:*
a little spear drop embracing(*a*) a little spear(*b*) a little spear drop embracing.

Notes.—(*a*) An indirect reference to coitus.
(*b*) *'ŋindjə'rəri* means a smaller spear than the *'ŋindji* and refers to the penis.

Explanation. The man drops his *'ŋindji* spear and has coitus.

(93) *'bi:rana: 'bi:rana: 'gi:gi:lədi: 'walwal'buŋu: 'bi:rana: 'bi:rana:*
full moon(*a*) make a noise dig up sand with the hands/full moon full moon.

Note.—(*a*) Usual word for moon *'bi:ra* (half-moon, *'kandi:ba* which literally means " the last rib bone ").

Explanation. The song refers to the full moon when lovers may meet ; *'gi:gi:lədi* refers to the noise made when digging out a hollow in the sand in which they intend to lie.

(94) *'ma:maŋu: 'rabitaŋa:*(*a*) *'rabita: 'gudju:ba: 'muranu: 'den 'bada:'badanu:*
the father rabbit rabbit another one(*b*) have coitus (*c*) fall over.

Notes.—(*a*) *'rabita:* the word for the introduced European rabbit has probably taken the place of a word referring to an indigenous animal. On the other hand the whole song may have been made up by the children, being based on an older theme.
(*b*) The female rabbit.
(*c*) The noise made by rabbits when they copulate.

Explanation. Two rabbits copulate and fall over in the act.

(95) *'gulban'dulgu: 'al-li:li: 'gulban'dulgu: 'walga: 'mendi: 'al-li:li: 'gulban'du: 'walga:*
go back/and tell them (*a*) go back/and tell them marks dry twig (*a*) go back/and tell/marks.

Note.—(*a*) Grasping with one's hand several times.

Explanation. This song refers to a seduction of a *'wɔni'djara* by her *'nji:dara* (" fancy boy "). The latter grasps her several times ; she says that she will go back to the camp and tell everyone what he did. She is protesting only half-heartedly, and later on the ground may be seen marks and a dry twig.

(96) *'jambul'laragu: 'gulban'dulgu: 'walu: 'remi:'remi:'gulban'dulgu:*
embracing/(*a*) go back/and tell them/(*b*) (*c*) go back/and tell them

'jambul'laragu: 'walu: 'remi:'remi: 'walu: 'remi:'remi: 'gulban'du
embracing/(*a*) (*b*) (*c*) (*b*) (*c*) go back/and tell.

Notes.—(*a*) To run against or into bushes.
(*b*) To overlook a clear space from a hill or sand-ridge.
(*c*) Refers to a certain erotic dance performed by women. With their arms raised above their heads, they shake their bodies and breasts without moving from where they stand. This may be performed by one woman or by a group.

Explanation. A man attempts to embrace his *'wɔni'djara* ; she tries to escape and runs into bushes. She says that she will go back to the camp and tell everyone. She then dances for him while he sits down and looks at her. The dancing is calculated to arouse the man to sexual ardour.

This song reveals the fact that children are aware of these erotic dances, which are sometimes preparatory to love-making. They are sung not only by boys, but also by young men. The younger children would learn such a song from their older brothers. Some of the young informants assured one of us that they had seen such a dance while hidden in acacia bushes on the crest of a sand-ridge.

(97) *'ilgəla: 'gandara: 'ŋa:ru ga: 'raŋa:'raŋa:*
name of a young man place hand on leg stand up sticks together(*a*)
'ŋa:ruŋu: 'muŋa:'jambal'ali: 'tji:ga:'tji:ganini: 'ilgəla:
stand up night/embrace " huddle together " name of young man
'gandarana: 'muŋa:'jambal'ali: 'tji:ga:'tji:ga:'ŋaruŋ
place hand on leg night/embrace " huddle together "/stand up
'gandara:'jambal'ali:
place hand on leg/embrace.

Note.—(*a*) An indirect reference to coitus.

Explanation. *'Ilgəla,* a young man, stands up ; he places his hand on her leg. It is night-time and they embrace ; they keep on lying together throughout the night for warmth.

(98) *'walba: 'bara:ri: 'wɔŋgandela: 'ju:du:ra: 'dagulu:'dagulu:*
wind a long way roar of the wind(*a*) wind-break(*b*) a sand depression
'gadiŋu: ! 'galu: 'wɔnbul'wɔnbul
take it ! penis " a long one "(*c*).

Notes.—(*a*) I.e. the wind is speaking ; *'wɔŋgai,* to talk.
(*b*) Usually *'ju.*
(*c*) I.e. lengthened, as an erect penis.

Explanation. The roar of the wind is far away. In the wind-break, in a scooped sand depression, the penis becomes erect. Take it !

(99) *'ja:gu:nei 'djara:wei 'la:ri:'la:ri: 'gudei 'ja:gu:nei*
a little girl buttocks undulating (*a*) brother a little girl
'djara:wei 'la:ri:
buttocks undulating (*a*).

Note.—(*a*) Translated by informant as " a rude boy "—refers to a small boy who interferes with little girls.

Explanation. A little girl undulates her buttocks to attract a tribal brother (whom she may not marry) who is a *'la:ri 'la:ri* boy.

(To be concluded.)

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